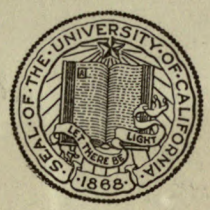
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THE HYDROIDS OF THE WOODS HOLE REGION.

By C. C. NUTTING,
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INTRODUCTORY NOTE.

The limits of the "Woods Hole region," in the sense here used, may be roughly defined as follows: Starting with the point of Cape Cod as the northern and eastern limits, following the New England coast to New London, Conn.; thence southward to the end of Long Island; thence southeast to the edge of the Gulf Stream, which is followed until off Cape Cod. These limits embrace, roughly, the area that can be covered by one-day excursions by steamer from the U. S. Fish Commission station at Woods Hole, Massachusetts.

It is the purpose of this pamphlet to furnish collectors and workers in this region with a practical and concise means of identifying the species of hydroids known to occur within the area above described. There are a number of other species that almost certainly occur within the Woods Hole region, but with one or two exceptions, involving species of unusual interest, these will be omitted.

Most of the material studied in connection with this work was secured by the author during three summers spent at the U. S. Fish Commission laboratory at Woods Hole and a month at the laboratory of Dr. Alexander Agassiz, at Newport.

The number of species listed indicates a fairly rich hydroid fauna in the region, the general relation being with the Arctic or rather Holarctic fauna, which explains the large percentage of British forms represented on our Atlantic coasts.

The illustrations are from sketches originally made by the author to illustrate a monograph of the North American hydroids, in course of publication by the United States National Museum. Permission was given by the authorities of that institution to have ink tracings made from these sketches, which have been reduced in size and used in the present work.

In order to secure the brevity necessary for the treatment of the subject in the form of a practical guide to identification, it has been necessary to omit all discussion regarding synonomy. In naming genera and species a conservative course has been followed, although the names in some cases have been changed in what will doubtless appear to be an arbitrary manner. The reasons for these changes are in all cases briefly indicated, but the explanations are not so full as would be deemed requisite in a work of more strictly technical nature.

Much remains to be done before we can discuss with profit the economic bearings of the subject of this work. It is well known, however, that many fishes feed more

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or less extensively on hydroids. Dr. Edwin Linton has several times called my attention to the fact that he often finds hydroids in the stomachs of fishes while examining them for parasites. I am inclined to think, however, that hydroids do not constitute a very important item in the dietary of our food-fishes, and am rather of the opinion that the economic importance of hydroids lies in the fact that the presence of these forms in quantities in a given region is of value as an indication of abundance of food for fishes in the shape of small crustaceans. It is known that many kinds of hydroids live very largely on minute crustacea, and it follows that where the hydroids thrive the fishes will also find an abundant food supply, especially in the earlier stages of their development.

The author is indebted to many naturalists for material that he failed to secure himself, and has endeavored to briefly acknowledge these favors in their proper connection in the body of the text.

STATE UNIVERSITY OF IOWA, *August 10, 1900.*

Key to the families of Hydroida found in the Woods Hole region.

A. Hydranths and gonophores not provided with special chitinous receptacles.
- *a.* Hydranths with scattered filiform tentacles ..... CLAVIDÆ.
- *a'.* Hydranths with a single whorl of filiform tentacles, or two or more closely approximated whorls around base of proboscis, which might easily be mistaken for a single whorl.
  - *b.* Proboscis conical.
    - *c.* Colony regularly branched ..... BOUGAINVILLIDÆ.
    - *c'.* Colony not branched.
      - *d.* Hydrorhizæ composed of incrusting, adherent tubules overlaid with a film of cœnosarc. HYDRACTINIDÆ.
      - *d'.* Hydrorhizæ not mutually adherent and not overlaid with a layer of cœnosarc ..... PODOCORYNIDÆ.
  - *b'.* Proboscis trumpet-shaped or hemispherical, the distal portion being the bell of the trumpet or equator of the hemisphere ..... EUDENDRIDÆ.
- *a''.* Hydranths with more than one whorl of filiform tentacles.
  - *b.* A distinct tube of horny perisarc around the stem.
    - *c.* Distal tentacles in two distinct whorls ..... TUBULARIDÆ.
    - *c'.* Distal tentacles not in two distinct whorls ..... HYBOCONIDÆ.
  - *b'.* No distinct perisareal tube; stem conspicuously canaliculated; proboscis large ..... CORYMORPHIDÆ.
- *a'''.* Hydranths with capitate tentacles only ..... SYNCORYNIDÆ.
- *a''''.* Hydranths with a basal row of filiform tentacles, and with capitate tentacles on the proboscis ..... PENNARIDÆ.

A'. Hydranths and gonophores provided with special chitinous receptacles. (Hydrotheeæ and gonangia.)
- *a.* Hydrotheeæ with distinct pedicel, and with a septum partly dividing the hydrotheeal cavity from the cavity of the pedicel ..... CAMPANULARIDÆ.
- *a'.* Hydrotheeæ with an operculum composed of converging segments ..... CAMPANULINIDÆ.
- *a''.* Hydrotheeæ deep, with pedicels; or sessile, and without the septum ..... LAFŒIDÆ.
- *a'''.* Hydrotheeæ reduced to saucer-shaped hydrophores ornamented with a necklace of bright dots, and much too shallow to accommodate the hydranths ..... HALECIDÆ.
- *a''''.* Hydrotheeæ sessile, and adnate by their sides to the branches on which they are placed.
  - *b.* Hydrotheeæ arranged on both sides of the branches ..... SERTULARIDÆ.
  - *b'.* Hydrotheeæ arranged on one side only of the branches ..... PLUMULARIDÆ.

CLAVIDAE.

Trophosome.—Hydrocaulus branched, simple, or not evident. Hydranths with elongated terete bodies, upon which the smooth filiform tentacles are scattered, or arranged in an ill-defined spiral.

Gonosome.—Gonophores growing from the hydrorhiza, branches, or body of the hydranths, and not producing free medusæ.

Key to genera of Clavidæ found in Woods Hole region.

Colony unbranched. Hydranth stems not inclosed in perisareal tubes ..... *Clava.*
Colony profusely branched ..... *Cordylophora.*

CLAVA.

Trophosome.—Hydranths single, with slender basal portions and terete bodies. Filiform tentacles, about 20 to 30 in number, scattered over the body and proboscis.

Gonosome.—Gonophores borne in clusters immediately below the basal tentacles.

Clava leptostyla Agassiz. Fig. 1.

(Contributions to the Natural History of the United States, 1862, IV, p. 218.)

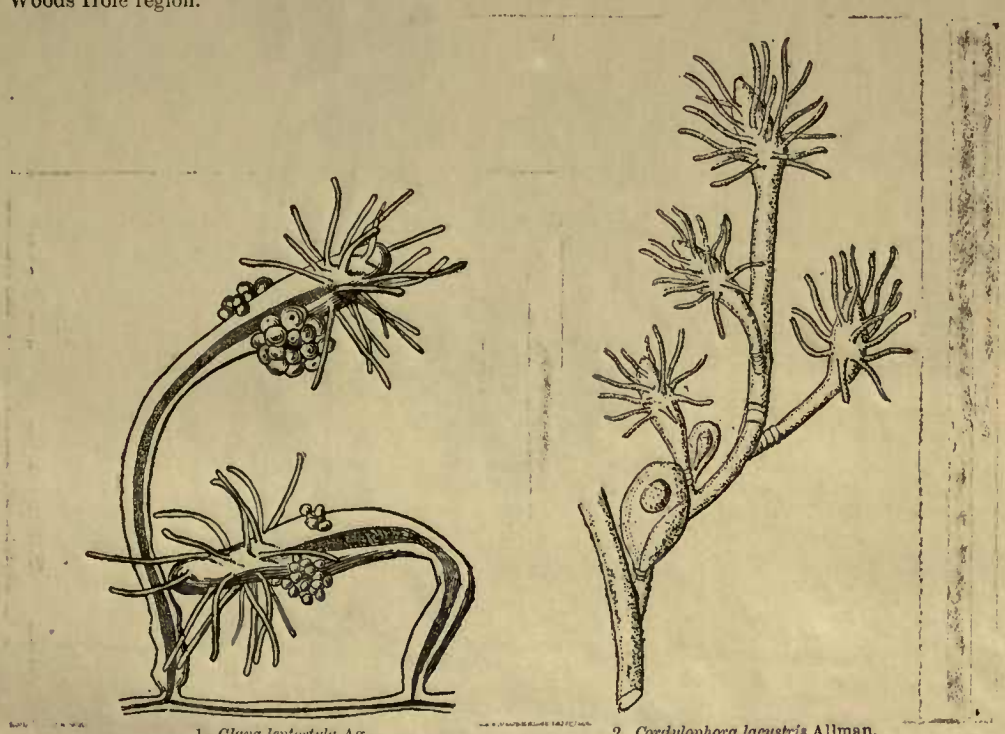
Trophosome.—Hydranths with a slender proximal portion and a long distal proboscis; tentacles more than 20 in full-grown specimens, hydrorhiza forming a closely aggregated meshwork of contiguous tubes.

Gonosome.—Gonophores borne below the proximal tentacles in compact clusters, which may encircle the hydranths or be unsymmetrically collected on one side.

Color.—Brick-red.

Distribution.—Has been found on the rocks near the Hole, where it occurs in patches under the seaweed. I have also found it attached to the piles of the old guano wharf.

Under the head of "distribution," localities are given where the species have been found in the Woods Hole region.



1. *Clava leptostyla* Ag. 2. *Cordylophora lacustris* Allman.

CORDYLOPHORA.

Trophosome.—Colony regularly branched. Hydranths with scattered filiform tentacles.

Gonosome.—Gonophores borne on the branches, ovate, inclosed in a chitinous investment which resembles a gonangium.

Cordylophora lacustris Allman. Fig. 2.

(Brit. Assoc. Rep., 1843.)

Trophosome.—Colony regularly branched, attaining a height of about three-fourths inch. Main stem not fascicled, straight, giving off alternate branches, which in turn often give off alternate branch-

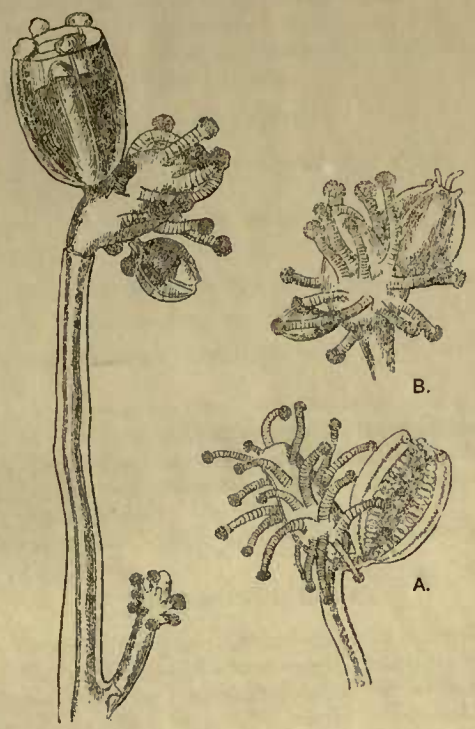


lets and pedicels; branches and pedicels often annulated at their origins. Hydranths with fusiform bodies and 16 to 20 scattered filiform tentacles.

Gonosome.—Gonophores ovate, invested in a gonangium-like extension of perisarc, borne on the branches and hydranth pedicels near their bases. Pedicels of gonophores very short and annulated.

Distribution.—Found in a fresh-water pond near the bathing beach at Woods Hole, Mass.

This species is reported from the Woods Hole region just as these pages are going to press. The figure and description are from specimens collected by Prof. A. D. Morrill and kindly forwarded to me by Dr. Charles Hargitt.



3. *Coryne mirabilis* (Ag.). A. Sessile medusa (♀). B. Sessile medusa (♂).



4. *Corynitis agassizii* McCr. (After Murbach.)

Sync

SYNCORYNIDÆ.

Trophosome.—Hydranths with capitate tentacles only, scattered over the elongated body or growing in more or less distinct verticils.

Gonosome.—Gonophores usually borne above the bases of the proximal tentacles, and producing attached or free medusæ with 4 radial canals and 4 tentacles with bulbous bases, and a deep bell.

Key to genera of Syncorynidæ found in the Woods Hole region.

A chitinous perisarc investing the stem. Hydranth body shorter than stem when expanded.....*Syncoryne.*
No chitinous perisarc. Hydranths sessile, with long cylindrical bodies.....*Corynitis.*

SYNCORYNE.

Trophosome.—Hydrocaulus well developed, often branched and more or less annulated. Hydranths with numerous stout capitate tentacles and terete bodies.

Gonosome.—Medusæ as described above, bulbous bases of tentacles often with dark eye-spot.

Syncoryne mirabilis (Ag.). Fig. 3.

(*Coryne mirabilis* Agassiz, Cont. Nat. Hist. U. S., IV, p. 185.)

Trophosome.—Colony irregularly branching, without distinct hydrorhiza. Hydranths with terete body and about 16 stout capitate tentacles. Perisarc not annulated.

Gonosome.—Medusæ borne on the hydranth body, with 4 radial canals and 4 marginal tentacles, which are rudimentary and without evident eye-spots in the sessile medusæ, and a very large proboscis on which the sexual elements are produced and cast forth before the medusæ become free. The free medusæ are more hemispherical in shape and have fully developed tentacles with eye-spots on their bases, and the proboscis is much smaller.

Color.—Polyps rose-red owing to color of lining of body cavity.

Distribution.—Found attached to rocks, seaweed, and floating timbers (A. Agassiz). Specimens were found in both the U. S. Fish Commission and Marine Biological Laboratories, but the labels did not indicate the localities. Waquoit. (Vinal Edwards.)

CORYNITIS.

Trophosome.—No evident perisarc. Colony consisting of single cylindrical hydranths with spirally arranged capitate tentacles.

Gonosome.—Gonophores on hydranth body producing medusæ with two tentacles which bear stalked batteries of nematocysts.

Corynitis agassizii McCrady. Figs. 4 and 80.

(Proceedings Elliott Society, vol. I, No. 1, p. 132.)

Trophosome.—Colony not branched. Hydranth with a long, cylindrical body and spirally arranged capitate tentacles.

Gonosome.—Gonophores growing low down on the body of the hydranth. Medusæ almost spherical, the surface dotted with clusters of nematocysts. Marginal tentacles 2 or 4, with swollen bases and thickened ends. Ovaries on basal portion of the proboscis. Mouth lobed.

Color.—Medusæ with manubrium, eye-spots and ends of tentacles red. Ovaries orange red.

Distribution.—Found at Woods Hole. (Dr. Murbach.)

I have not seen this species, but Dr. Murbach has kindly allowed tracings to be made from his drawings, to be used in this work.

BOUGAINVILLIDÆ.

Trophosome.—Colony branching (in our species) and with a distinct hydrocaulus. Hydranths with a dome-shaped or conical proboscis, and a single whorl of rigid filiform tentacles.

Gonosome.—Gonophores borne on hydrocaulus below the hydranth body. (Never from the hydrorhiza in our species.) Medusa with 4 radial canals. Marginal tentacles either single or in clusters, with sense bodies at their bases.

Key to genera of Bougainvillidæ found in the Woods Hole region.

Hydrocaulus with a strongly marked chitinous perisarc. Medusæ with clustered marginal tentacles and ramified mouth tentacles.....*Bougainvillia.*
Hydrocaulus with a gelatinous perisarc. Medusæ with a single marginal tentacle, and no mouth tentacles..*Perigonimus.*

BOUGAINVILLIA.

Trophosome.—Perisarc strongly marked, branched, and ending below the bases of the tentacles of the hydranths.

Gonosome.—Gonophores borne on pedicils springing from the hydrocaulus. Medusæ with 4 pairs of marginal tentacles when first set free, afterwards with 4 clusters of tentacles, each tentacle with a black eye-spot above its base.

Key to species of Bougainvillia found in the Woods Hole region.

Hydranths with small proboscis and 15 to 20 tentacles. Medusæ with very broad proboscis.....*B. superciliaris.*
Hydranths with conspicuous conical proboscis. Medusæ with a narrow proboscis.....*B. carolinensis.*

Bougainvillia superciliaris Ag. Fig. 91.

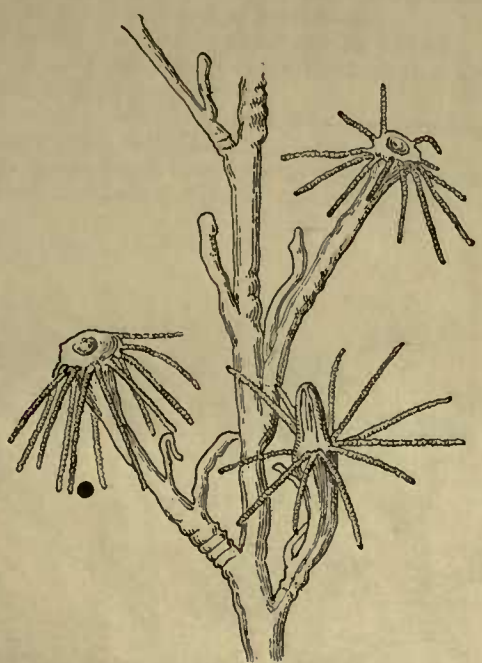
(Cont. Nat. Hist. U. S., IV, p. 289.)

Trophosome.—Colony attaining a height of about 2 inches. Stem not fascicled, irregularly branched, branches and branchlets often annulated proximally. Hydranths with very inconspicuous proboscis and 15 to 20 rigidly disposed tentacles.

Gonosome.—Gonophores borne mostly on the ultimate branches. Mature medusæ with a very broad and heavy proboscis and much ramified mouth tentacles. Each cluster of marginal tentacles with a large sense-bulb at its base.

Color.—Colony light brown with a greenish tinge. Hydranth body with a suggestion of rose color. Medusæ with a pale-yellow proboscis tinged with red at the end. Sense bodies orange-red surrounded with yellow.

Distribution.—Newport, R. I., attached to fucus and shells. Woods Hole. I have not seen the trophosome of this species and have culled the description from that of Dr. Alexander Agassiz. The medusa was taken by me at Woods Hole on August 11, 1899.



5. *Bougainvillia carolinensis* (McCr.)



6. *Perigonimus jonesi* Osborn & Hargitt.

Bougainvillia carolinensis (McCr.). Fig. 5.

(*Hippocrene carolinensis* McCrady. Proc. Elliott Soc., vol. I, No. 1, p. 164.)

Trophosome.—Colony attaining a height of 12 inches, but usually 3 to 6 inches, and branching much as in the preceding species. Hydranths growing on both main stem and branches, with a long, prominent, very flexible proboscis, which may be a lengthened cone, or may be rolled back until it assumes a saucer-like shape; tentacles not more than 12 in specimens examined.

Gonosome.—Gonophores borne on both main stem and branches, often in clusters. Mature medusæ much like the last, but with a short and narrow proboscis.

Color.—Colony light brown with greenish tinge, hydranth body with reddish tinge. Medusæ with brick-red proboscis and sense-bulbs red surrounded by green and yellow. Eye-spots jet-black.

Distribution.—Growing on the piles of the U. S. Fish Commission's dock at Woods Hole, and common in the vicinity. It is often found attached to fucus and floating timber.



PERIGONIMUS.

Trophosome.—Colony attaining a height of about 1 inch, either branched or simple; perisarc of a jelly-like consistency and reaching to the bases of the tentacles. Hydranth body terete, the proboscis being large and conical.

Gonosome.—Gonophores borne on the branches or hydranth bodies, in our species. Medusæ bell-shaped, with a simple or lobed proboscis. Marginal tentacles 2 or 4, not in clusters, and with bulbous bases and no eye-spots.

Perigonimus jonesi Osborn & Hargitt. Fig. 6.

(American Naturalist, vol. XXVIII, p. 27.)

Trophosome.—Colony attaining a height of about one-fourth inch, freely branching, the branches erect and continuing insensibly into the hydranth body; gelatinous perisarc very thick and often wrinkled, reaching to the bases of the tentacles, and sometimes appearing to include the proximal part of the latter. Hydranths with about 16 tentacles held rigidly, but alternately depressed and elevated; proboscis dome-shaped or subconical.

Gonosome.—Gonophores borne on the hydranth body or branches. Medusæ ovoid, with 2 tentacles, 4 radial canals, and 4 eye-spots; manubrium short with a 4-lobed mouth.

Color.—Colony flesh-colored.

Distribution.—Found on the abdomen and walking legs of *Labinia emarginata*. Collected at Coldspring Harbor, Long Island.

This species does not come strictly within the Woods Hole region, but as it is the only American *Perigonimus* yet described it seemed desirable to include it here.



7. *Eudendrium ramosum* Linn. A. Hydranth bearing female gonophores.

EUDENDRIDÆ.

Trophosome.—Colony branching, often profusely; perisarc evident, often regularly annulated. Hydranths with a single verticil of filiform tentacles, and a proboscis that is at times trumpet-shaped and at times hemispherical, the distal end being the larger.

Gonosome.—Gonophores (male) forming verticils just beneath the tentacles of the hydranth, each verticil being composed of a number of gonophores radiating like the spokes of a wheel, each gonophore having 2 to 4 chambers in linear series; female gonophores not in regular verticils, and usually clustered around the hydranth bodies. No medusæ.

EUDENDRIUM.

Characters of the family as given above.

Key to species of Eudendrium found in the Woods Hole region.

A. Main stem fascicled. (Larger species.)
  a. Stem and branches extensively annulated throughout. Hydranth body vasiform ..... *E. dispar.*
  a'. Branches and pedicils annulated at proximal ends only.
    b. Colony large, pinnately branched. Male gonophores with 2 or 3 chambers..... *E. ramosum.*
    b'. Colony smaller, less than 3 inches. Male gonophores 4 or 5 chambered and borne on atrophied hydranths..... *E. carneum.*

A'. Main stem not fascicled. (Smaller species.)
  a. Hydranth body globular; pedicils long, slender. Male gonophores 4 or 5 chambered..... *E. tenue.*
  a'. Hydranth body vasiform, colony bushy; pedicils strong, shorter. Female gonophores on aborted hydranths..... *E. capillare.*
  a''. Hydranth body vasiform; colony minute, about one-fourth inch, sparsely branched; pedicils very long, slender and pellucid. Gonophores borne on aborted hydranths..... *E. album.*

Eudendrium ramosum (Linn.) Fig. 7.

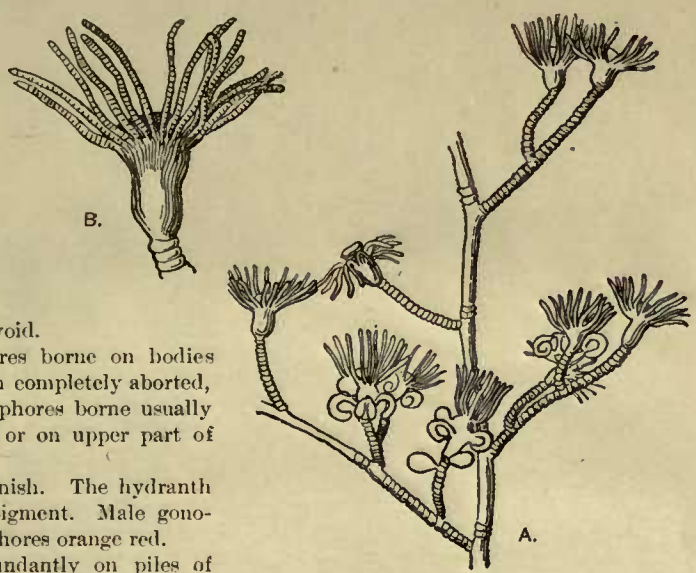
(*Tubularia ramosa* Linn., Syst. Nat., p. 1302.)

Trophosome.—Colony bushy, attaining a height of 6 inches; stem fascicled, the main branches giving off pinnately disposed branchlets; annulations confined to bases of internodes and ends of pedicils. Hydranth body ovoid.

Gonosome.—Male gonophores borne on bodies of hydranths that are not often completely aborted, 2 or 3 chambered; female gonophores borne usually on hydranths below tentacles, or on upper part of pedicils.

Color.—General color greenish. The hydranth bodies lined with vermilion pigment. Male gonophores vermilion; female gonophores orange red.

Distribution.—Growing abundantly on piles of U. S. F. Co. wharf at Woods Hole. One of the commonest forms flourishing in shallow water.



8. *Eudendrium dispar* Ag.

Eudendrium dispar Ag. Fig. 8.

(Cont. Nat. Hist. U. S., IV, p. 285.)

Trophosome.—Colony large, attaining a height of 5 inches. Stem slender, slightly fascicled, with extensively annulated branches and pedicils. Hydranth body vasiform.

Gonosome.—Gonophores borne on hydranths, which are not aborted and usually not reduced in size.

Color.—General color greenish. Hydranths rose-colored. Male gonophores orange; female gonophores pink.

Distribution.—Found in rather deep, clear water. Nanshon (A. Agassiz). U. S. Fish Commission station 7060, off Block Island. (Nutting.)



Eudendrium carneum Clarke. Fig. 9.

(Mem. Boston Soc. Nat. Hist., III, No. 4, p. 137.)

Trophosome.—Colony attaining a height of about 2 inches; main stem fascicled, pinnately branched, the branches not so widely spreading as in *E. ramosum*. Annulations usually confined to the proximal ends of branches and pedicils, except that the pedicils bearing aborted hydranths and gonophores are deeply ringed throughout. Hydranth body subvasiform.

Gonosome.—Male gonophores 4 or 5 chambered, borne in a verticil around the body of aborted hydranths, which are themselves joined to pedicils bearing ordinary hydranths, the two being thus borne in pairs symmetrically disposed on the branches.

Color.—Hydranth bodies and gonophores bright red.

Distribution.—The specimen described was found in the U. S. Fish Commission collection at Woods Hole. Labeled December 17, 1888.



9. *Eudendrium carneum* Clarke. 10. *Eudendrium tenue* A. Ag.

Eudendrium tenue A. Ag. Fig. 10.

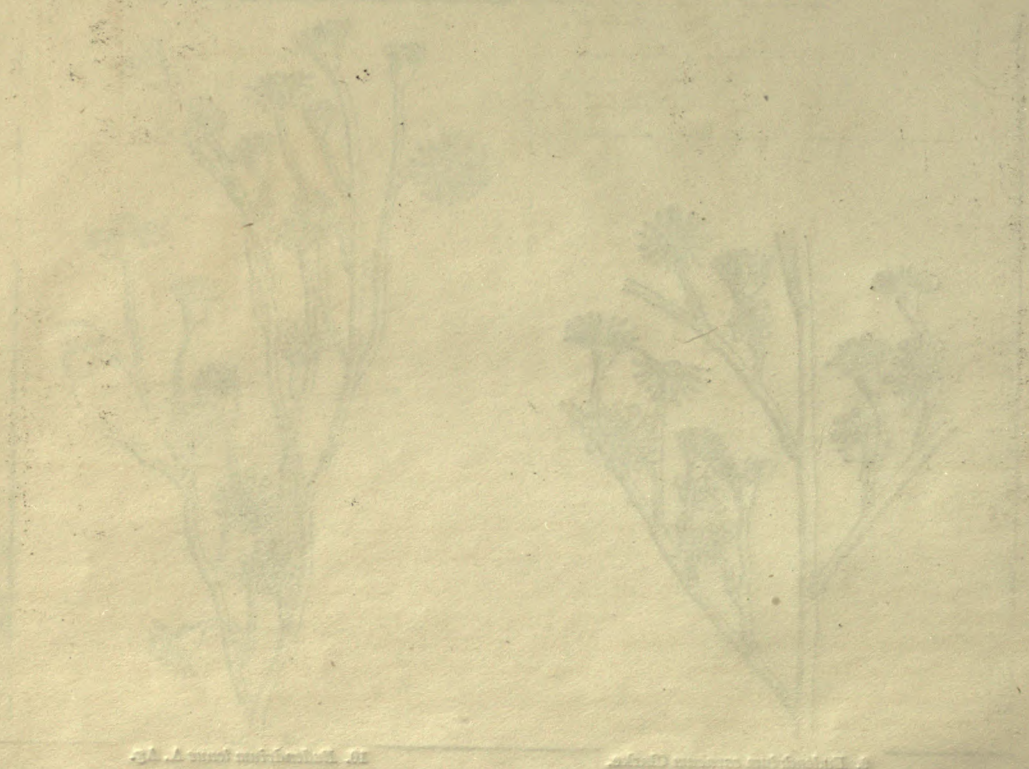
(North American Acalephæ, p. 160.)

Trophosome.—Colony branching irregularly, attaining a height of about one-half inch. Stem not fascicled, loosely branching, the pedicils being long and slender. Hydranth body globular.

Gonosome.—Male gonophores 2 to 4 chambered, borne on unbranched annulated pedicils, the hydranths of which have become aborted. Female gonophores globular, scattered over hydranth body and pedicils. (A. Agassiz.)

Color.—General color bright pinkish. (A. Agassiz.)

Distribution.—Shallow water in Buzzard's Bay. Naushon.



Eudendrium capillare Alder.

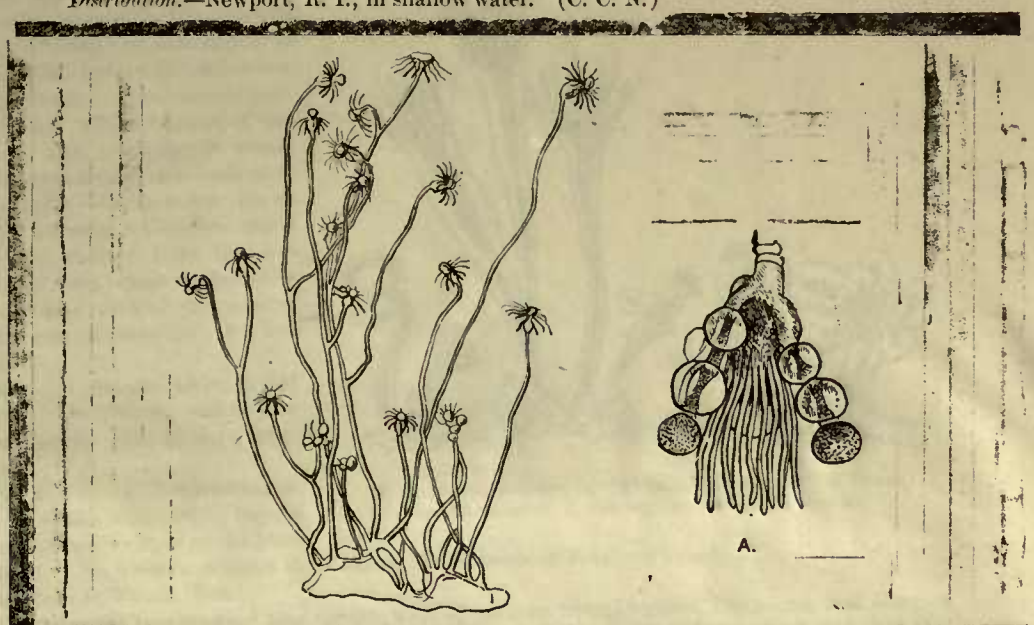
(Catalogue of the Zoophytes of Northumberland and Durham, p. 105.)

Trophosome.—Colony attaining a height of about one-half inch, sparsely branching, the branches and pedicils being sparingly annulated. Hydranth body vasiform.

Gonosome.—Male gonophores 2 or 3 chambered, borne on aborted hydranths springing either from the branches or hydrorhiza. Female gonophores also borne on aborted hydranths.

Color.—Hydranths pale greenish. Male gonophores orange.

Distribution.—Newport, R. I., in shallow water. (C. C. N.)



11.—*Eudendrium album* Nutting. A. Hydranth with male gonophores.

Eudendrium album Nutting. Fig. 11.

(Annals and Magazine of Natural History, May, 1898, p. 362.)

Trophosome.—Colony minute, attaining a height of about one-third inch, branching in a straggling manner, the ultimate branches or pedicils being exceedingly long and slender, pellucid, and not decidedly or regularly annulated. Hydranths with vasiform bodies.

Gonosome.—Male gonophores 2 or 3 chambered, borne on hydranths that are generally not aborted, but may be considerably reduced in size. Female gonophores apparently not so numerous as in allied species, borne on partially aborted hydranths.

Color.—General color white, hydranths almost entirely so. Male gonophores pale orange yellow.

Distribution.—Found on floating seaweed secured in taking the tow at Woods Hole; also on U. S. Fish Commission wharf.

HYDRACTINIDÆ.

Trophosome.—Colony formed of "persons" of three sorts springing from an incrusting layer beset with jagged spines. Perisarc not evident. Hydranths with a single whorl of filiform tentacles and a conical proboscis. "Spiral zooids" or defensive persons slender, cylindrical, spirally coiled, with large nematocyst batteries near their distal ends.

Gonosome.—Gonophores fixed sporosacs borne on blastostyles, forming a third or sexual person of the colony.

HYDRACTINIA.

Characters of the family as given above.



H. Tubularium album Nutting. A. Hydranth with male gonophores.

Hydractinia polyclina Ag. Fig. 12.

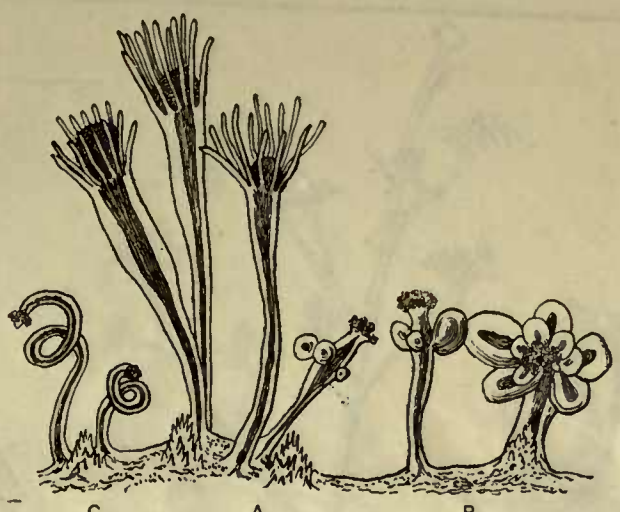
(Cont. Nat. Hist. U. S., IV, p. 227.)

Trophosome.—Colony composed of thickly crowded persons arising from an incrusting plate beset with jagged spines and overlaid with cœnosarc. Hydranths slender, gradually increasing in size from proximal to distal end, tentacles numerous, filiform, arranged in several closely approximated whorls, which are so closely set as to appear as one whorl at the base of the rather low conical proboscis. Spiral zooids generally situated on the borders of the colony and with a number of nematocyst batteries around the distal end.

Gonosome.—Gonophores borne on sexual persons which are much stouter and shorter than the hydranths, and have numerous batteries of nematocysts around the conical proboscis, but no tentacles. No free medusæ.

Color.—Hydranths white, tinged with red. Gonophores, which give the characteristic color to the colony, bright red.

Distribution.—Found growing on gasteropod shells inhabited by hermit crabs, on the bare rock, or on the piles of wharves. The writer has found them among the colonies of *Tubularia crocea* on the U. S. Fish Commission wharf at Woods Hole.



12. *Hydractinia polyclina* Ag. A. Nutritive "person." B. Reproductive persons. C. Spinal zooids on fighting persons.

I have carefully compared this species with *H. echinata* from England, and found that the two are quite distinct as claimed by Agassiz. Aside from the characters as given by him I find that the European form has very much larger hydranths than the American, and much less numerous tentacles.

PODOCORYNIDÆ (modified).

Trophosome.—Hydranths with a single whorl of filiform tentacles around the base of a conical proboscis. Hydrorhiza a reticulate network of stolons invested with perisarc and usually beset with jagged spines.

Gonosome.—Gonophores growing in a circlet around the basal part of the hydranth body, and producing fixed sporosacs or free medusæ with 4 radiating canals and 4 or 8 marginal tentacles with eye-spots at their bases.

STYLACTIS.

Trophosome.—Hydranths sessile, without evident perisarc, slender, growing from a hydrorhiza composed of a network of anastomosing tubes which are not covered with naked cœnosarc, and which usually bear chitinous spines.

Gonosome.—Sporosacs borne on the hydranth body just below the tentacles, and producing medusæ with 8 rudimentary tentacles and no mouth.

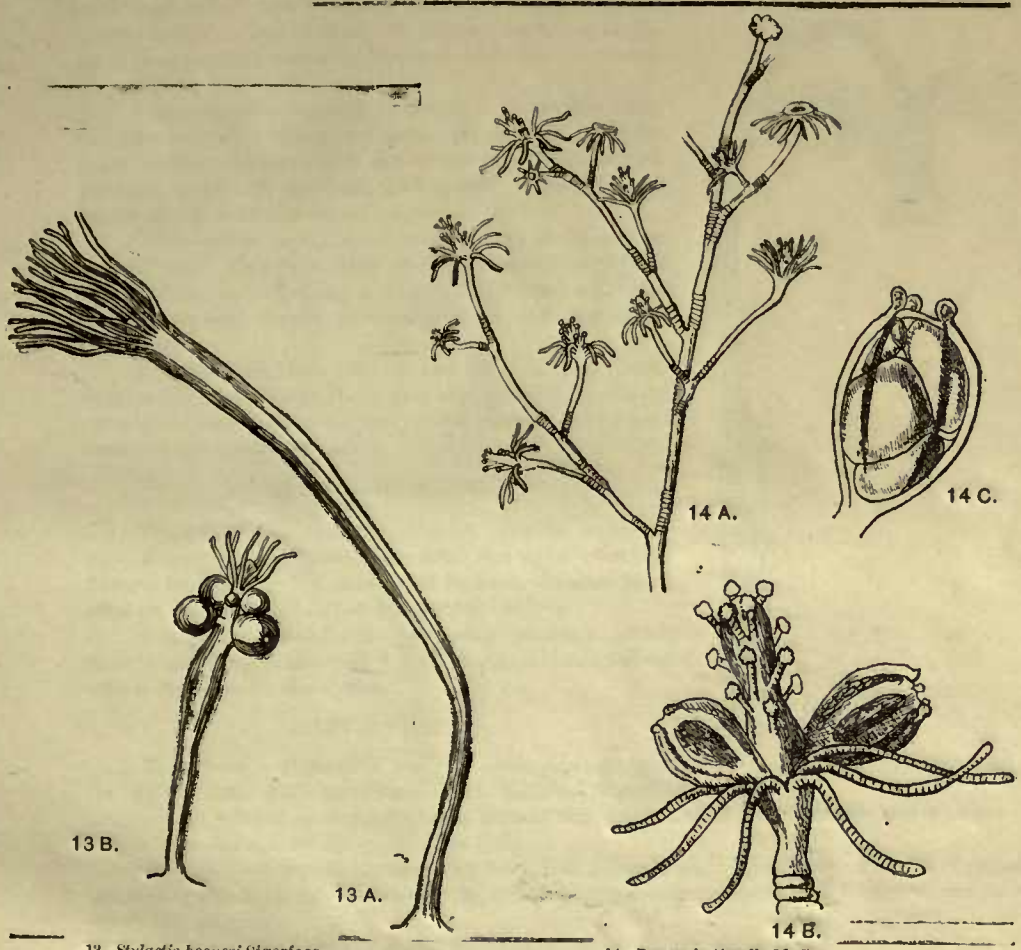
Stylactis hooperi Sigerfoos. Figs. 13 and 86.

(American Naturalist, XXXIII, No. 394.)

Trophosome.—Hydranths exceedingly slender and attaining a height when alive of about three-fourths inch. Tentacles in a single whorl, very variable in number, the average, according to Sigerfoos, being 18 to 25. Hydrorhiza covered with a felting of diatoms, etc., but with no covering of naked cœnosarc.


C
A
B

Gonosome.—Gonophores borne on shorter hydranths just below the tentacles and producing free medusæ with 4 radial canals, 8 rudimentary tentacles, and neither mouth nor eye-spots. Ova borne on the very large manubrium.



13. *Stylactis hooperi* Sigerfoos.
A. Nutritive hydranth or "person."
B. Reproductive hydranth or "person."

14. *Pennaria tiarella* McCr.
A. Branch of colony.
B. Hydranth with medu sæ (enlarged).
C. Single sessile medusæ (enlarged).

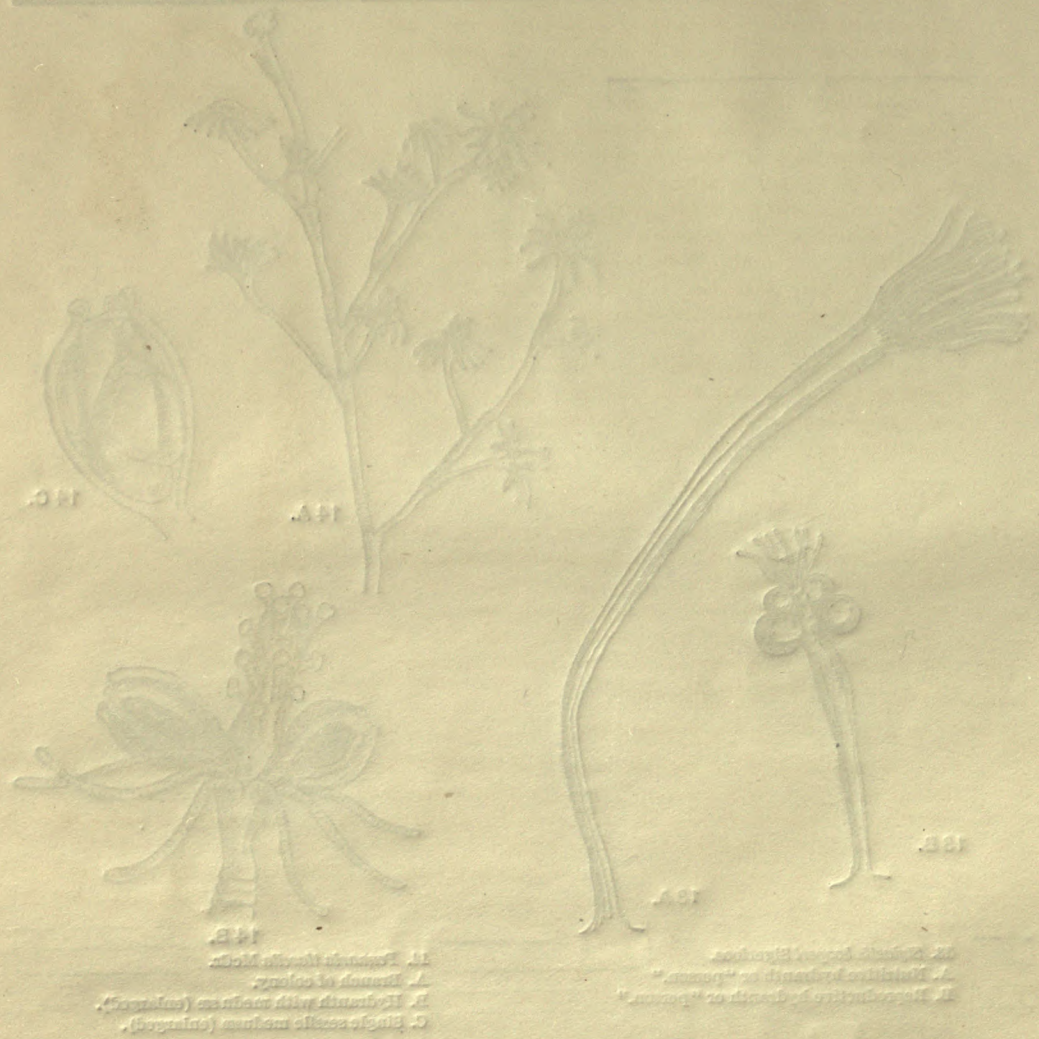
Color.—A specimen kept for some time in formalin is of a reddish flesh color. I have not seen the free medusæ, and the color is not given by the original describer.

Distribution.—Found on shells of a living gasteropod, *Ilyanassa obsoleta*. A colony was found at Woods Hole in 1886. Dr. Sigerfoos found numerous specimens at Coldspring Harbor, Long Island.

PENNARIDÆ.

Trophosome.—Colony regularly branched (in our species). Hydranths with a proximal circlet of filiform tentacles and a distal set of spirally arranged or whorled capitate tentacles.

Gonosome.—Gonophores producing medusæ which are either attached permanently or become free when mature, and which have 4 radiating canals and 4 rudimentary tentacles.


14A.
14B.
14C.
15A.
15B.

PENNARIA.

Trophosome.—Colony pinnately branched, with a pronounced chitinous perisarc. Hydranths with a pyriform body and long mobile proboscis beset with capitate tentacles.

Gonosome.—Gonophores borne above the proximal row of tentacles. Medusæ oblong ovate, with a very large proboscis bearing the sexual products.

Pennaria tiarella McCr. Figs. 14 and 84.

(Proceedings Elliott Soc., vol. 1, No. 1, p. 153.)

Trophosome.—Colony attaining a height of about 6 inches, with main stem and branches geniculate and beautifully annulated above origin of each branch, branchlet, and pedicel. Hydranths large, the ones terminating branches being decidedly larger than the others; a basal whorl of about 12 filiform tentacles, and a number of capitate tentacles disposed in indistinct whorls on proboscis.

Gonosome.—Gonophores attached to hydranth body just above whorl of filiform tentacles, and producing oblong-ovate sessile medusæ which sometimes give forth sexual products while still attached, and sometimes become free before giving forth the sexual products.

Color.—Stem horn brown with darker areas at the annulations. Hydranth body lined with vermilion, which shows through, producing a beautiful contrast with the white tentacles. Sessile medusæ greenish with vermilion markings.

Distribution.—Abundant on the piles of Fish Commission dock at Woods Hole, and also growing profusely on eelgrass near the Hole. One of the most abundant and beautiful species on our coasts.



15. *Corymorpha pendula* Ag.

CORYMORPHIDÆ.

Trophosome.—Hydranths solitary, without complete tube of perisarc, and having proximal and distal whorls of filiform tentacles, and a number of fleshy or tubular processes on the proximal end of the pedicel or stem.

Gonosome.—Gonophores producing medusæ which have 4 radiating canals and 1 to 4 marginal tentacles, of which one is much the largest.

CORYMORPHA.

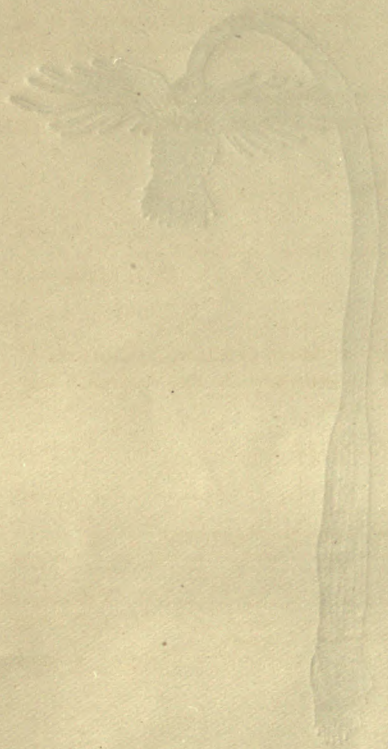
Trophosome.—Hydranth sharply distinguished from its pedicel and with numerous short filiform tentacles arranged in several closely set whorls around the distal end of the proboscis and a single whorl of larger tentacles around the base of the body.

Gonosome.—Gonophores borne on branched pedicels above the proximal whorl of tentacles and producing fixed or free medusæ with either a single large tentacle or 4 tentacles, one of which is much the largest.

Corymorpha pendula Ag. Fig. 15.

(Cont. Nat. Hist. U. S., IV, p. 276.)

Trophosome.—Hydranths attaining a height of 3 to 4 inches when alive and fully extended. Pedicel with canaliculated cœnosarc, the canals appearing superficially as longitudinal bands which anastomose, especially on the proximal part of the pedicel, the distal part of which is abruptly



attenuate and pendant. In place of the hydrorhiza the basal part of the pedicel is frayed out, as it were, into numerous hollow tubular processes.

Gonosome.—Gonophores borne on branched peduncles inserted above the proximal row of tentacles. Medusæ with 1 large tentacle and usually 3 much smaller ones.

Color.—Hydranth body and gonophores bright pink. Medusa with light-yellow proboscis and pink tentacle bulbs.

Distribution.—Sandy and muddy bottoms in rather deep water. The specimens in the U. S. Fish Commission collection at Woods Hole are not labeled, but are said to be from Smith Hole.

TUBULARIDÆ.

Trophosome.—Hydrocaulus with a distinct tubular perisarc, branched irregularly or not at all. Hydranths with a proximal and distal set of filiform tentacles. An adherent, creeping hydrorhiza often produced.

Gonosome.—Gonophores borne above the proximal whorl of tentacles on branched peduncles, and not producing free medusæ. The females produce hydra-like actinules which develop directly into new colonies.

Key to the genera of Tubularidæ found in the Woods Hole region.

Hydranths permanently attached by a regular hydrorhiza ..... *Tubularia.*
Hydranths not permanently fixed, the stem or pedicel giving off buds from its free end, which are separated by spontaneous fission and develop into new hydranths ..... *Hypolitus.*

TUBULARIA.

Trophosome.—Colony branched or unbranched, attached by permanent chitinous hydrorhiza.

Gonosome.—Gonophores borne in pendent clusters attached by peduncles to the hydranth body above the proximal tentacles. Female gonophores producing actinules.

Key to the species of Tubularia found in the Woods Hole region.

A. Sessile medusæ with distinct radial canals and apical processes ..... *T. cathouyi.*
A′. Sessile medusæ without distinct radial canals, and with conical apical processes.
a. Cœnosarc forming a distinct expansion in the stem just below the hydranth. Perisarc extensively annulated, ... *T. larynx.*
a′. Perisarc not extensively annulated.
b. Hydranths large. Habitat, shallow water ..... *T. spectabilis.*
b′. Hydranths small. Habitat, deep water ..... *T. tenella.*
A″. Sessile medusæ without distinct radial canals, and with apical processes of females flattened.
Hydranths large. Habitat, shallow water ..... *T. crocea.*

Tubularia cathouyi Ag[1]. Fig. 16.

(Cont. Nat. Hist. U. S., IV, p. 266.)

Trophosome.—Stems unbranched, often annulated, attaining a height of 5 to 7 inches. Hydranth large, probably the largest on our coasts, often expanding an inch or more; proximal whorl of tentacles 30 to 40 in number; distal set very much smaller and shorter.

Gonosome.—Gonophores growing in dense racemes from the hydranth body just above proximal whorl of tentacles. Sessile medusæ with 4 radial canals and without tentacular processes at the oral end. Females producing actinules.

Color.—Stem and gonophores bright scarlet.

Distribution.—Found in brackish water usually. A number of beautiful specimens were sent me by Dr. Mead, of Brown University, who had them growing in a submerged flatboat at Providence, R. I. A few specimens were taken from a depth of 30 fathoms by the *Fish Hawk* in latitude 40° 49′ 45″, longitude 70° 42′. Mr. George Gray reports them from Quick Hole and off Nobska Point.

Tubularia larynx Ellis & Solander. Fig. 17.

(Nat. Hist. Corallines, p. 30.)

Trophosome.—Colony bushy; stems branched and extensively annulated, attaining a height of 1 to 1½ inches. Cœnosarc of the stem forming a curious collar-like expansion below the hydranth. Hydranth with 16 to 20 proximal tentacles, and about the same number in the distal set.

Gonosome.—Gonophores borne in dense clusters, the female without evident radial canals, and with conical tentacular processes at their oral ends.

Color.—Perisarc, in adult specimens, yellow. Body of hydranths and gonophores pinkish scarlet.

Distribution.—Found on rocky and shelly bottoms. A number of specimens secured growing on *Eucopium dispar* and on sea weed at U. S. Fish Commission station 7060, Muskegat Life-Saving station bearing N. by E. ½ E. 4½ miles. Depth, 5 fathoms.

Tubularia spectabilis (Ag.). Fig. 18.

(*Thamnocnidia spectabilis* Agassiz, Con. Nat. Hist. U. S., IV, p. 271.)

Trophosome.—Colony irregularly branched and sparsely annulated, attaining a height of about 4 inches. Hydranths with about 20 tentacles in the proximal row and nearly the same number in the distal row.

Gonosome.—As in the last species, except that the clusters of gonophores are larger and longer.

Color.—The stems are very pale; almost white. Hydranth body and gonophores rose red.

Distribution.—Found on rocks at end of Newport Island. At Woods Hole, locality not given.



16. *Tubularia cathouyi.*
A. Sessile medusa.



17. *Tubularia larynx* Ell. & Sol.



18. *Tubularia spectabilis* (Ag.).
A. Gonophore containing an actinule.

Tubularia tenella (Ag.).

(*Thamnocnidia tenella* Ag., Cont. Nat. Hist. U. S., IV, p. 273.)

Trophosome—Colony very small for this genus, hardly exceeding 1 inch in height. Stems loosely branching, not distinctly annulated. Hydranths with a proximal row of about 18 tentacles, and about the same number in the distal row.

Gonosome.—As in the last species.

Color.—Stem pale, almost white. Hydranth bodies and gonophores pink.

Distribution.—The open ocean in rocky pools (A. Agassiz). Vineyard Sound, 6 to 10 fathoms. (A. E. Verrill.)

The best distinguishing mark of this species seems to be its small size, only about half that of *T. spectabilis.*



Tubularia crocea (Ag.). Fig. 19.

(*Parypharocrocea* Ag., Cont. Nat. Hist, U. S., vol. IV, p. 249.)

Trophosome.—Colony growing in dense tufts of stems entangled below and separated into long pedicels above, attaining a height of 3 to 4 inches. Stems unbranched or sparsely branched, annulated slightly at intervals, and swollen just below the hydranth. Hydranth with a body whorl of about 20 to 24 tentacles, and about the same number in the distal set.

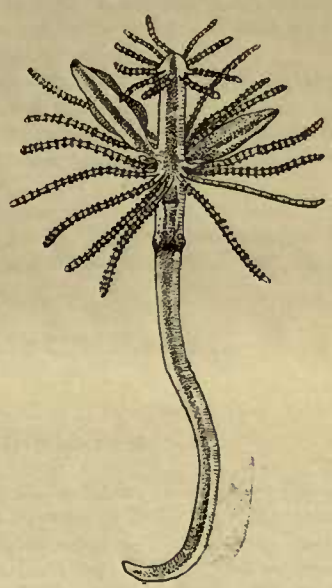
Gonosome.—Gonophores growing in racemes or clusters. Sessile medusæ with a group of about four tentacular processes at its oral end, those of the female being laterally compressed. There are no evident radiating canals.

Color.—Body of hydranths and gonophores rose red. Stems pale, almost white.

Distribution.—Found growing very profusely on the piles of the Fish Commission dock at Woods Hole; also on the piles of the docks at New Haven and other similar places.

This species is exceedingly difficult to distinguish from *T. spectabilis*. Indeed, little confidence can be placed in identification of specimens without mature female gonophores.





19. *Tubularia crocea* (Ag.). A. Cluster of gonophores. 20. *Hypolytus peregrinus* Murb.[sic] (After Murbach.)

HYPOLITIS.

Trophosome.—Colony consisting of single hydranths with a long proboscis and a distal and proximal whorl of filiform tentacles. The proximal end of the stem is free.

Gonosome.—Gonophores borne on the proboscis immediately above the proximal whorl of tentacles. They occur singly and not in clusters in the type specimen. The sessile medusæ are long and terete in form, and show no tentacular processes.

Hypolytus perigrinus Murbach. Fig. 20.

(Quart. Journ. Mic. Sci., vol. 42, part 3, p. 341.)

The generic description above is sufficient to identify the one known species of the genus.

Description condensed from original; figure copied from that of Dr. Murbach, with his permission.

HYBOCONIDAE.

Trophosome.—Colony unbranched. Stem with a distinct chitinous perisarc, and rooted to a true hydrorhiza. Hydranths large, with a proximal and distal set of filiform tentacles.

Gonosome.—Gonophores producing free medusæ.



HYBOCODON.

Trophosome.—Stem with distinct, deeply annulated expansion just below hydranth. Hydranth with a proximal whorl and two distinct but closely approximated distal whorls of filiform tentacles.

Gonosome.—Gonophores attached directly to the hydranth body without the intervention of peduncles, and developing into free medusæ, each of which has a single large tentacle bearing succeeding generations of medusæ. Medusæ deeply campanulate, with 4 radial canals and a short proboscis.

Hybocodon prolifer Ag. Fig. 76.

(Cont. Nat. Hist. U. S., IV, p. 243.)

Trophosome.—Hydrocaulus unbranched, longitudinally striped owing to the cœnosarcal canals showing through; perisarc suddenly enlarging near the hydranth, where a number of collar-like swollen rings appear, the uppermost being the largest. Hydranth much like that of *Tubularia*, but with two distinctly separated whorls of tentacles around the proboscis, each whorl being composed of about 16 tentacles, the lower being twice as long as the upper.

Gonosome.—Gonophores adnate to the hydranth body just above the basal whorl of tentacles, producing free medusæ with four radial canals and five superficial meridional orange-colored bands when fully mature. The single tentacle is greatly enlarged, and near its base a number of medusæ in various stages of development are attached, and these again may in the same manner bear still other groups of medusæ.

Color.—The pigmentation of both hydranth and medusæ is orange red.

Distribution.—Deep pools of sea water (Agassiz). The medusa only has been taken at Woods Hole, being collected in the tow net by Mr. Vinal Edwards on March 2. At that time the orange bands were not conspicuous.

Suborder CALYPTEROBLASTEA.

Hydrothecæ and gonangia present.

CAMPANULARIDÆ.

Trophosome.—Hydrothecæ well developed, nonoperculate, either with distinct pedicels or nearly sessile, but not adnate to or partly immersed in stem or branches. Hydrothecal cavity distinctly differentiated from cavity of stem by a septum perforated to allow a cœnosarcal connection between hydranth and pedicel. Hydranth with a trumpet-shaped or subglobular proboscis.

Gonosome.—Gonophores either developing the generative products directly or producing medusæ which usually have otocysts, and in which the ovaries are situated along the course of the radial canals and sometimes on the proboscis also, but never on the proboscis alone.

Key to genera of Campanularidæ found in the Woods Hole region.

A. Stem not regularly branched.
  a. Hydrothecæ on long pedicels.
    b. Free medusæ with four marginal tentacles at birth ..... *Clytia.*
    b'. No medusæ. Reproduction by planulæ ..... *Campanularia.*
  a'. Hydrothecæ tubular. Pedicels short. Margin of hydrothecæ entire, not toothed ..... *Hebella.*
A'. Stem regularly branched.
  a. Free medusæ with 16 or more marginal tentacles. Lithocysts on the bases of tentacles ..... *Obelia.*
  a'. No free medusæ, the mature gonangia bearing medusa-like sporosacs on their summits ..... *Gonothyræa.*
  a''. No free medusæ, the planulæ being developed within the gonangium ..... *Campanularia.*

The *Campanularidæ* offer great difficulties in identification, owing to the necessity of basing generic characters on the gonosome and the practical identity of the trophosomes of different genera. The following entirely artificial key, although inadequate in some cases, is presented to aid the collector and student in the identification of specimens without the gonosome.

Key for identification of Campanularidæ found in Woods Hole region (based on trophosome alone).

A. Stem neither regularly branched nor fasicicled. This includes cases where a pedicel supports other pedicels springing from it in an irregular manner.
  a. Pedicels strongly annulated throughout.
    b. Hydrothecal margin not toothed, but entire.....*Campanularia poterium*
    b'. Hydrothecal margin evidently toothed.
      c. Hydrothecæ small, tubular. Teeth very shallow.....*Clytia volubilis.*
      c'. Teeth sharp, deeply cut. Hydrothecæ small, with a tendency to irregular branching..*Campanularia minuta.*
  a'. Pedicels not strongly annulated except at ends.
    b. Hydrothecal teeth squared off at ends.
      Hydrothecæ ornamented with vertical lines.....*Campanularia hincksii.*
    b'. Hydrothecal teeth evenly rounded. Hydrothecæ very large, with parallel sides and exceedingly thin walls.....*Clytia grayi.*
    b''. Hydrothecal teeth sharply pointed, the extreme tips sometimes rounded.
      c. Pedicels usually more than three times the length of hydrothecæ. Hydrothecæ deeply campanulate.....*Clytia bicophora.*
      c'. Pedicels seldom more than three times the length of hydrothecæ.
        d. Hydrothecæ broad, often subtriangular in outline.....*Clytia noliformis.*
        d'. Hydrothecæ deep, cylindrical.....*Clytia cylindrica.*

A'. Stem regularly branched.
  a. Stem fasicicled.
    b. Hydrothecæ with pointed or regularly rounded teeth. Pedicels arranged in verticils around stem.....*Campanularia verticillata.*
    b'. Hydrothecæ with very shallow evenly rounded teeth. Colony with subverticillate branches..*Obelia longissima.*
    b''. Hydrothecæ with square, or bimucronate teeth.
      c. Hydrothecæ ornamented with vertical lines or longitudinal ridges.
        d. Hydrothecæ very deep, tubular. Pedicels with more than 6 annulations.....*Obelia bicuspidata.*
        d'. Hydrothecæ not so deep. Pedicels with usually 3 to 6 annulations.....*Obelia bidentata.*
      c'. Hydrothecæ without evident longitudinal lines.....*Obelia gelatinosa.*
  a'. Stem not regularly fasicicled.[1]
  a. Hydrothecal margin toothed.
    b. Pedicels usually in pairs or subopposite.....*Campanularia edwardsi.*
    b'. Pedicels regularly alternate.
      c. Pedicels longer than hydrothecæ, not completely annulated.....*Campanularia neglecta.*
      c'. Pedicels shorter than hydrothecæ.
        d. Aperture of hydrothecæ broader than middle part.....*Gonothyræa tenuis.*
        d'. Aperture scarcely broader than middle part.....*Gonothyræa loveni.*
  a'. Hydrothecal margin even, not toothed.
    b. Colony with a very slender central stem from which much-branched short lateral branches arise in a verticillate manner.
      c. Hydrothecæ triangular in outline. Pedicels usually with 4 to 6 annulations.....*Obelia flabellata.*
      c'. Hydrothecæ deeper, subtriangular in outline. Pedicels usually with more than 6 annulations.....*Obelia commissuralis.*
      c''. Hydrothecæ deeply campanulate. Pedicels often considerably longer than hydrothecæ, and with their middle portions not annulated.....*Campanularia amphora.*
    bi. Colony not branched in a regularly verticillate manner.
      c. Stem nearly straight, branches strong, suberect, and giving off bushy branchlets. Hydrothecæ very deep, campanulate. Pedicels very short.....*Obelia dichotama.*
      c'. Stem strongly flexuose, or geniculate, usually not profusely branched, and giving off alternate pedicels.
        d. Stem flexuose. Hydrothecæ deep, with slightly everted margins. Pedicels sometimes quite long, with middle portions not annulated.....*Campanularia calceolifera.*
        d'. Stem decidedly flexuose, each pedicel forming a graceful curve continuous with the internode from which it springs. Hydrothecæ campanulate. Pedicels with 6 to 12 annulations.....*Campanularia flexuosa.*
        d''. Stem geniculate, or abruptly bent at the nodes.
          e. Pedicels long, with many annulations.....*Campanularia angulata.*
          e'. Pedicels short, borne on broad processes from stem. Hydrothecæ subtriangular...*Obelia geniculata.*

A''. Colony parasitic, usually growing in a straggling or irregular manner over other hydroids. Hydrothecæ tubular, with even margins. Pedicels very short, sometimes hardly apparent..(Genus *Hebella.*)
  a. Hydrothecæ large, curved. Colony almost always found growing symmetrically over *Sertularia cornicina*.....*Hebella calcarata.*
  a'. Hydrothecæ much smaller. Colony growing in a straggling manner over various hydroids and other organisms.....*Hebella pygmæa.*

[1] An appearance of fasciculation is often produced when a simple stem is overgrown with parasitic hydroids, or even when young colonies are growing over older ones of the same species.

CLYTIA.

Trophosome.—Colony not regularly branched. Hydrothecæ with toothed margins and long pedicels.

Gonosome.—Gonangia containing gonophores which produce medusæ with 4 radial canals, 4 marginal tentacles at birth, and 8 lithocysts between the tentacle bases.

Key to the species of Clytia found in the Woods Hole region.

Hydrothecæ small, bell-shaped, with deeply cut teeth ..... *C. bicophora.*
Hydrothecæ small, cylindrical, with sharp teeth and short pedicels..... *C. cylindrica.*
Hydrothecæ larger, stout, broadly campanulate, or subtriangular in outline, with large, evenly rounded teeth..... *C. noliformis.*
Hydrothecæ very large, with parallel sides and evenly rounded teeth..... *C. grayi.*

Clytia bicophora Ag. Fig. 21.

(Cont. Nat. Hist. U. S., IV, p. 304.)

Trophosome.—Stem seldom branching, never regularly so. Hydrothecæ deeply campanulate, with about 14 pointed teeth. Pedicels large, long, annulated at the ends, usually smooth through the middle portion.

Gonosome.—Gonangia deeply and evenly ringed, resembling a Chinese lantern, usually borne on the root stock, sometimes on the stem. Medusa when liberated hemispherical, with 4 tentacles and 8 lithocysts situated between the bases of the tentacles, and a short manubrium.

Distribution.—Shallow water, attached to shells, other hydroids, seaweed, etc. Found on the stems of *Tubularia crocea* growing on the piles of the U. S. Fish Commission dock at Woods Hole.

Both Hincks and Verrill regard this species as identical with *Clytia johnstoni* Alder, of British waters. I have carefully compared American specimens of *C. bicophora* with specimens of *C. johnstoni* from England, and find that the former is a much more delicate and smaller species, the hydrothecæ of *C. johnstoni* being on the average twice as long and wide as those of *C. bicophora*.



21. *Clytia bicophora* Ag.

Clytia cylindrica Ag.

(Cont. Nat. Hist. U. S., IV, p. 306.)

Trophosome.—Stems unbranched, with pedicels shorter than in *C. bicophora*, annulated at the proximal and distal ends. Hydrothecæ cylindrical, small, deep, with about 10 deeply cut, sharply pointed teeth.

Gonosome.—Gonangia slender, oblong, flattened, not annulated, containing developing medusæ which escape singly. Medusæ not described.

Distribution.—Much as in the last species. Found in Buzzards Bay and at Naushon. (A. Agassiz.)

I have not seen this species, and have compiled the above descriptions from the writings of Louis and Alexander Agassiz.



22. *Clytia noliformis* (McCr.)

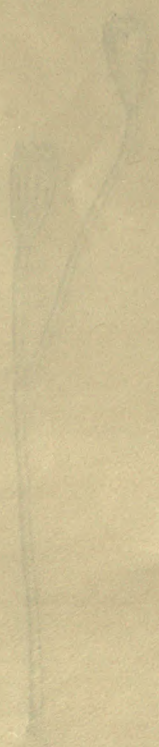
Clytia noliformis (McCr.). Fig. 22.

(*Campanularia noliformis* McCr., Proc. Elliott Soc., vol. I, No. 1, p. 194.)

Trophosome.—Pedicels short, unusually not more than twice as long as the hydrothecæ, strongly annulated, rising from a creeping rootstock. Hydrothecæ broadly campanulate, with 10 to 12 very prominent, deeply cut teeth with rounded points. Texture of hydrothecæ stouter than in other species of the genus.

Gonosome.—My specimens are without gonangia, and I have been unable to find any description of them.

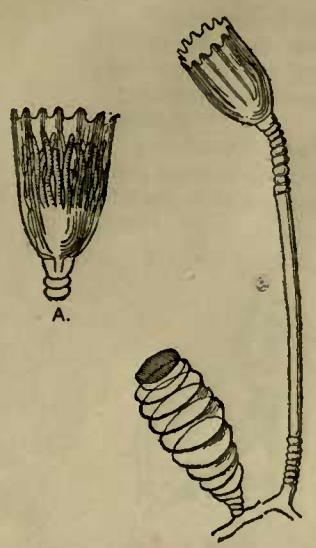
It is not certain that this species occurs in the Woods Hole region. Dr. Agassiz reports it from Buzzards Bay, but as he considers it identical with the *Clytia cylindrica* of his father's work, a species that appears to me to be distinct, I am not sure whether he had McCrady's species or not. My own specimens came from Beaufort, N. C.





Clytia grayi, new species. Fig. 23.

Trophosome.—Stems unbranched or irregularly branched, strongly annulated, except on middle portion. Hydrothecæ very large (twice as large as in *C. bicophora*), cylindrical, the sides being parallel and bottom hemispherical; marginal teeth about 16 in number, evenly rounded and not very deeply cut. There is often a tendency to a longitudinal plaiting, which shows as short, straight lines running downward from between the teeth. Hydranth with about 20 tentacles.



23. *Clytia grayi* Nutting.
A. Hydrotheca with hydranth (enlarged).

Gonosome.—Gonangia oblong, conspicuously and regularly annulated, attached to creeping rootstock. Medusæ not known.

Distribution.—Found growing on living worm tubes composed of sand. Dredged by the *Fish Hawk* at station 7051, latitude, 40° 46′ 30″ N.; longitude, 70° 40′ W. Depth 31 fathoms.

The largest *Clytia* yet found in American waters.

Named in honor of Mr. George Gray, of the Marine Biological Laboratory at Woods Hole, a man who has done much for American marine biology.

CAMPANULARIA.

Trophosome.[1]—Colony unbranched, regularly branched, or fascicled. Hydrothecæ, without operculum and with or without marginal teeth.

Gonosome.—Gonangia producing sexual products which develop into planulæ within gonangium. No medusæ.

Key to species of Campanularia found in the Woods Hole region.

A. Colony not regularly branched.
  a. Hydrothecæ with margin entire ..... *C. poterium.*
  a′. Hydrothecal margin toothed.
    b. Teeth square or truncated at top ..... *C. hincksii.*
    b′. Teeth very shallow, forming sinuosities or undulations around aperture. Hydrothecæ deep, tubular.. *C. volubilis.*
    b″. Teeth very sharp and deeply cut, pedicels long, stem irregularly branched ..... *C. minuta.*
A′. Colony regularly branched.
  a. Hydrothecal margin toothed.
    b. Teeth castellated or bimucronate ..... *C. neglecta.*
    b′. Teeth acute, stem not fascicled ..... *C. edwardsi.*
    b″. Teeth sharp or rounded, stem fascicled ..... *C. verticillata.*
  a. Hydrothecal margin entire.
    b. Branches arranged in subverticillate manner around a slender axial stem. Pedicels often longer than hydrothecæ ..... *C. amphora.*
    b′. Branches not arranged in a subverticillate manner. Main stem giving off alternate pedicels.
      c. Stem angulated, or strongly geniculate. Pedicels long ..... *C. angulata.*
      c′. Stem flexuose. Pedicels annulated throughout. Gonangia with a large terminal aperture ..... *C. flexuosa.*
      c″. Stem slightly flexuose. Pedicels long, not always annulated throughout. Gonangia with a subterminal aperture ..... *C. calceolifera.*

Campanularia poterium (Ag.). Fig. 24.

(Cont. Nat. Hist. U. S., p. 297.)

Trophosome.—Stem unbranched, the pedicels arising directly from annulated rootstock; pedicels annulate throughout, the annulations often oblique, giving a twisted appearance. Hydrothecæ deeply campanulate; aperture not toothed; basal portion thickened greatly, so as to include what appears to be the uppermost annulation. Hydranths with 24 tentacles.

Gonosome.—Gonangia rather slender, not decidedly annulated, growing from the rootstock. The sexual products pass through part of their development in an acrocyst resting on top of gonangium.

[1] It appears to be impossible to construct generic characters for the *Campanularidæ* on the basis of the trophosomes. The classification of the group is unnatural and unsatisfactory in the extreme, but this is not the place to attempt its rectification.



Distribution.—Found growing on stones, shells, seaweed, etc. A specimen in the U. S. Fish Commission collection is labeled: "Off Nantucket Island." Depth, 23 fathoms.

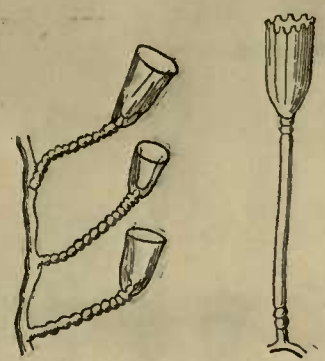
Campanularia hincksii Alder. Fig. 25.

(North. and Durh. Cat. in Trans. Tyneside Field Club, III, p. 127.)

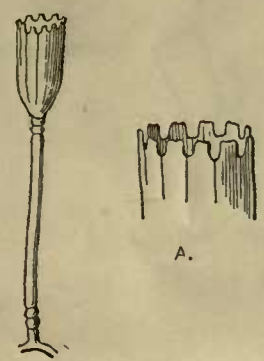
Trophosome.—Pedicels springing directly from a creeping rootstock, not extensively annulated. Hydrothecæ large, deep, cylindrical, with about 12 prominent square-topped teeth, from between which vertical lines pass down over the surface of the hydrotheca.

Gonosome.—Gonangia long, annulated, resembling that of *Clytia johnstoni*, but often not so deeply annulated.

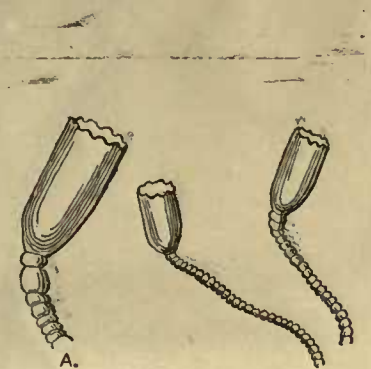
Distribution.—Growing on stones, shells, etc., in rather deep water. A specimen was secured from a depth of 15 fathoms near Newport, R. I. Contrary to the rule among campanularians, the hydranth of this specimen was brilliantly colored, the general color being yellow and the basal part scarlet.



24. *Campanularia poterium* (Ag.)



25. *Campanularia hincksii* Alder.
A. Upper part of hydrotheca (enlarged).



26. *Campanularia volubilis* (Linn.).
A. Hydrotheca (enlarged).

Campanularia volubilis (Linn.). Fig. 26.

(Syst. Nat., p. 1311, under name of *Sertularia volubilis.*)

Trophosome.—Pedicels long, extensively annulated, springing from a creeping rootstock. Hydrothecæ small, tubular, with about 10 shallow rounded marginal teeth.

Gonosome.—Gonagia borne on the rootstock, flask-shaped, with a long tubular neck and small terminal aperture.

Distribution.—Found growing on *Sertularella tricuspidata* on specimens in the U. S. Fish Commission collection; supposed to be from rather deep water.

The combination of tubular hydrothecæ with very shallow teeth and extensively annulated pedicels will differentiate this form from others on the North Atlantic coast.

Campanularia minuta, new species. Fig. 27.

Trophosome.—Stem branching in an irregular straggling manner, attaining a height of about one-fourth inch. Pedicels long, extensively annulated, rising almost parallel with the main stem, which is itself extensively annulated, although there are smooth portions of considerable extent. Hydrothecæ very small, deeply campanulate, with 8 to 10 very acute and prominent teeth.

Gonosome—Not known.

Distribution.—Parasitic on *Obelia commissuralis* from the piles of the wharf at New Bedford. Collected by Mr. Vinal Edwards.

This species appears to be quite distinct. It seems to be nearest to *C. raridentata* Alder, from which it differs in being branched, in the extent of annulations of the pedicels, and in the hydrothecæ being considerably broader in proportion to their length.



Campanularia edwardsi, new species. Fig. 28.

Trophosome.—Colony attaining a height of over an inch, branching somewhat irregularly, but with a distinct tendency to send off pedicels from the main stem in subopposite pairs. Stems, branches, and pedicels exceedingly long and slender, with the annulations confined to the proximal portions, except a few just below the hydrothecæ. Hydrothecæ very large, deeply campanulate, with 12 to 14 exceedingly sharp, slender teeth, more acuminate than in any other species in the region. Hydranth with about 28 tentacles.

Gonosome.—Unknown.

Distribution.—The type specimen was found on the piles of the U. S. F. C. dock at Woods Hole. This is one of the most distinct and beautiful of the American campanularians.

Named for of Mr. Vinal Edwards, the veteran collector at the U. S. F. C. station at Woods Hole.



27. *Campanularia minuta* Nutting. A. and B. Hydrothecæ (enlarged).

28. *Campanularia edwardsi* Nutting. A. Colony, natural size.

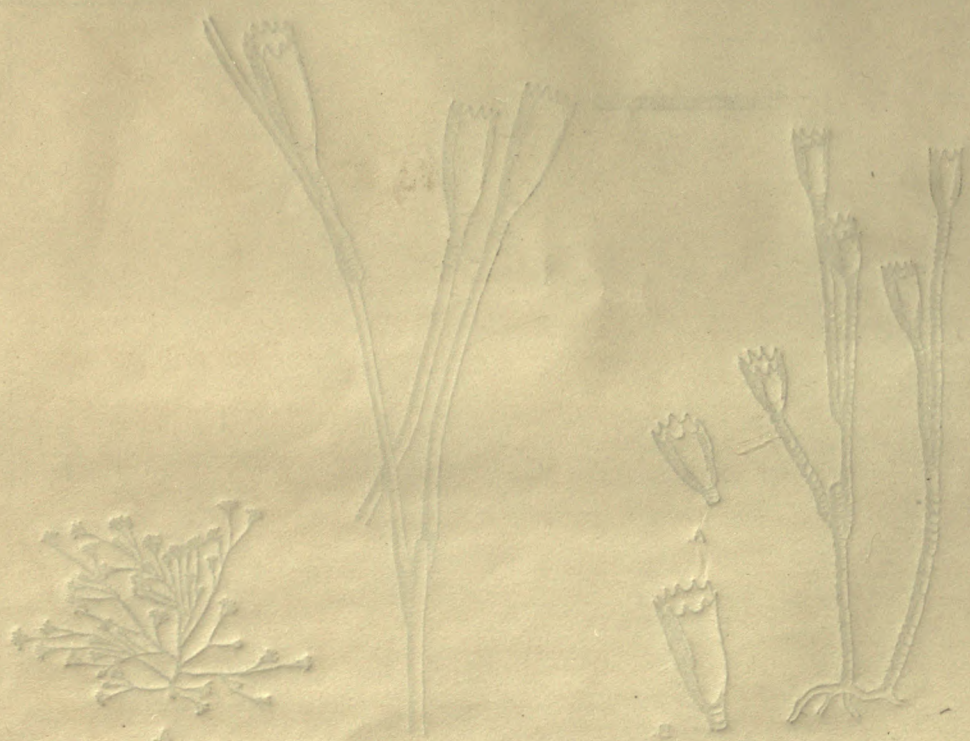
Campanularia neglecta (Alder.). Fig. 29.

(North. and Durham Cat. in Trans. Tyneside Field Club, p. 123.)

Trophosome.—Colony branching, main stem flexuose, giving off alternate pedicels which are long, slender, and annulated at the ends. Hydrothecæ deeply campanulate, almost tubular, with their margins armed with 8 to 10 teeth which are bimucronate; that is, the summit of each tooth is crowned with two minute denticles.

Gonosome.—Gonangia borne in the axils of the pedicels, oblong ovate, smooth, somewhat truncated above. The mature gonangium often has a globular acrocyst on its summit.

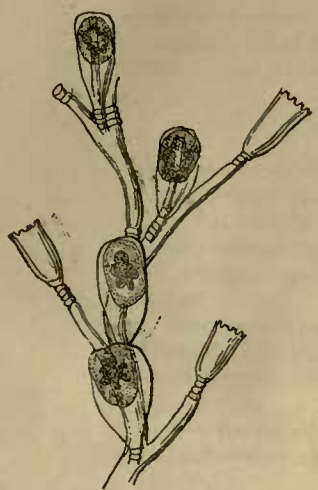
Distribution.—In shallow water, on stones, shells, and other hydroids. Reported by Professor Verrill from Casco Bay, Maine. I find it in my notes as occurring at Woods Hole, but fail to find specimens. The figure is from a British specimen.



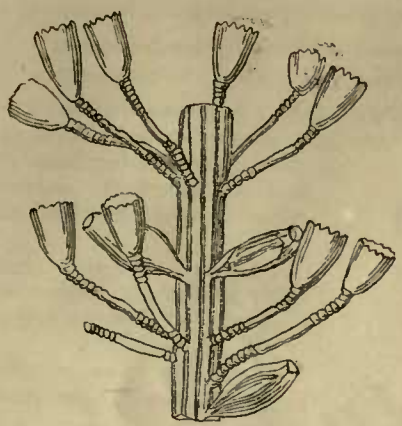
Campanularia verticillata (Linn.) Fig. 30.

(*Sertularia verticillata* Linn., Syst. Nat., p. 1310.)

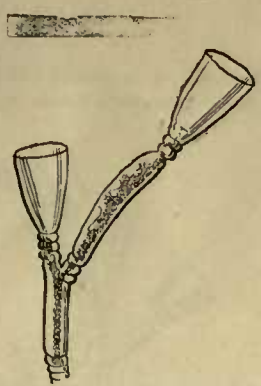
Trophosome.—Colony branched, attaining a height of about 5 inches. Stem and branches fascicled, composed of many parallel tubes from which the pedicels arise in a verticillate manner. Hydrothecæ large, rather broadly campanulate, with about 12 deeply cut acuminate teeth.



29. *Campanularia neglecta* (Alder).



30. *Campanularia verticillata* (Linn.).



31. *Campanularia amphora* (Ag.).

Gonosome.—Gonangia borne on the main stem and branches, oblong flask-shaped, with necks produced into tubular extensions with terminal openings.

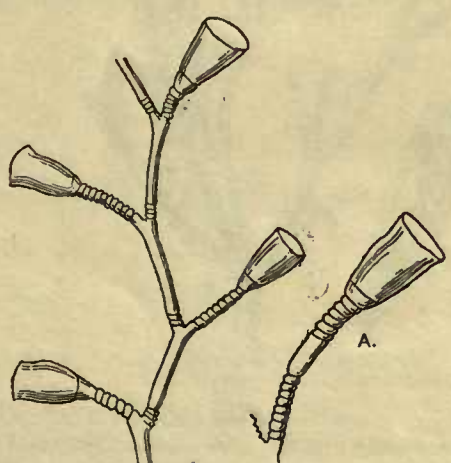
Distribution.—Found in rather deep water attached to stones, shells, etc., Block Island Sound, 17 to 45 fathoms; Fisher Island Sound, 4 to 11 fathoms. (Verrill.)

Campanularia amphora (Ag.). Fig. 31.

(*Lictomedia amphora* Ag., Cont. Nat. Hist. U. S., IV, p. 311.)

Trophosome.—Colony attaining a height of 6 to 7 inches, branching in a subverticillate manner; the branches incline upward more than in *Obelia commissuralis*, which it greatly resembles. "But the most marked difference is in the middle of each internode, where it bulges laterally and directly in line with the point of insertion of the branch or pedicel below it." (L. Agassiz.) Pedicels annulated. Hydrothecæ deeply campanulate, very gracefully formed, aperture entire, margin slightly everted. Hydranth with about 30 tentacles.

Gonosome.—Female gonangia elongate oval, about four times as longas the hydrotheca, somewhat truncate at top, and with a very small aperture. Male gonangia more slender, with a slightly produced neck.



32. *Campanularia angulata* Hincks.
A. Hydrotheca and pedicel (enlarged).

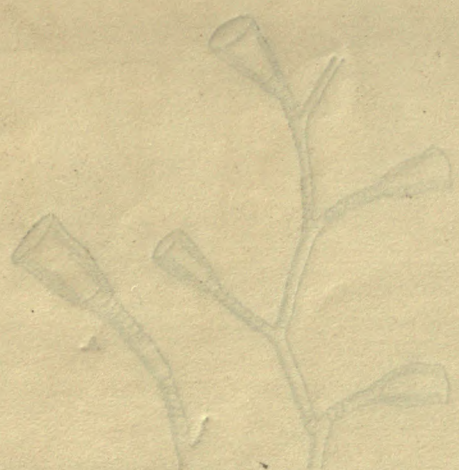
Distribution.—Common in shallow water in the Woods Hole region. This species is apt to be mistaken for *Obelia commissuralis* when the gonosome is absent.

Campanularia angulata Hincks. Fig. 32.

(Annals and Magazine of Nat. Hist., 3d series, VIII, p. 261.)

Trophosome.—Colony slightly branched, attaining a height of about three-fourths inch. Stem geniculate, with long internodes, annulated above the origin of each pedicel. Pedicels long, usually





annulated throughout. Hydrothecæ rather deeply campanulate, aperture entire. Hydranth with about 24 very slender tentacles.

Gonosome.—Gonangia borne on the rootstock, irregularly ovate, obscurely wrinkled, neck short and broad.

Distribution.—I have several fragmentary specimens from Woods Hole region that agree very closely with Hincks's figures. Comparing these, however, with some of the terminal branches of *C. amphora*, I find them to agree closely with these also. Verrill reports the species from Casco Bay. I do not know whether his material embraced the gonosome or not.

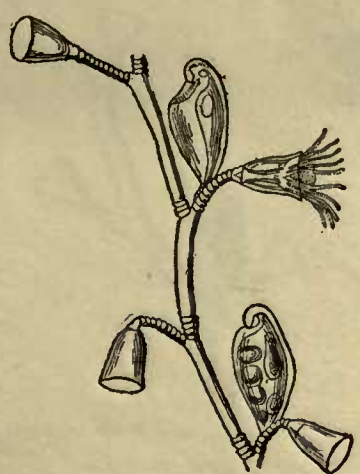
Campanularia calceolifera Hincks. Fig. 33.

(Annals and Magazine of Nat. Hist., 4th series, vol. VIII, p. 78.)

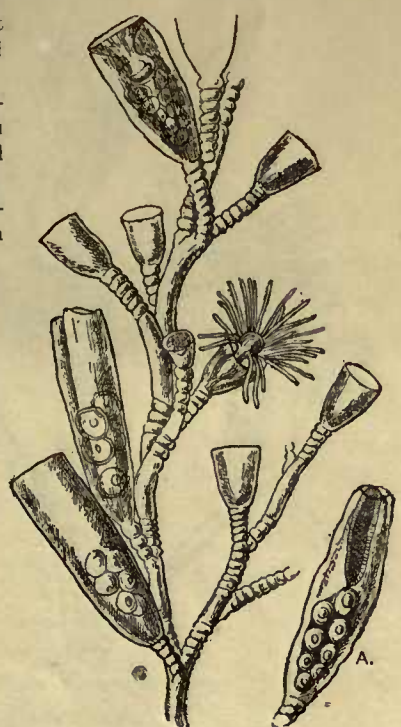
Trophosome.—Colony usually consisting of a single slightly flexuose stem, but sometimes it gives off long branches similar in every way to the main stem, which sends off alternate pedicels of varying length, but usually fully annulated and considerably shorter than the hydrothecæ. Hydrothecæ without teeth, deeply campanulate, and with gracefully everted margins.

Gonosome.—Gonangia of peculiar shape, tapering basally, with latero-terminal aperture from which a short, curved tube projects into the gonangial cavity.

Distribution.—In shallow water on stones, seaweed, submerged timbers, etc. Noank, Conn., on bottom of boat (Clarke). Woods Hole, on piles of U. S. Fish Commission's dock.



33. *Campanularia calceolifera* Hincks.



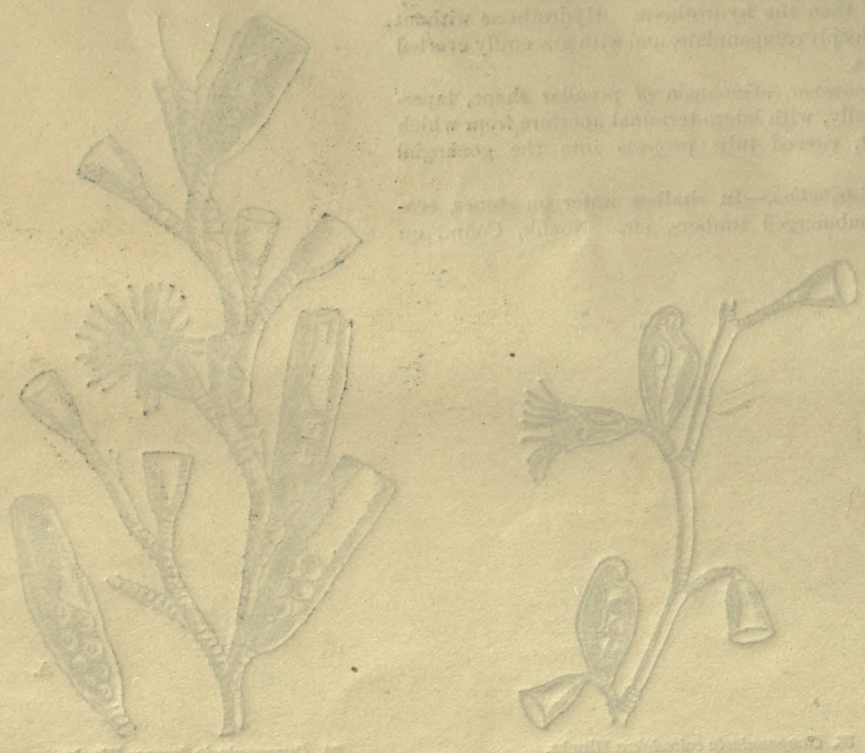
34. *Campanularia flexuosa* Hincks.
A. Gonangium with escaping Planula.

This beautiful species can be immediately identified when sexually mature. Otherwise the best character is the elegant shape of the hydrothecæ.

Campanularia flexuosa (Hincks). Fig. 34.

(Annals and Magazine of Nat. Hist., 3d series, vol. VIII, p. 260. Under name of *Laomedia flexuosa.*)

Trophosome.—Colony usually in the form of a single flexuose stem giving off a series of regularly alternating pedicels. Stem with three or four well-marked annulations above the origin of each pedicel; pedicels apparently continuous with the internodes from which they spring, and with which they curve continuously, rather large, completely annulated and diminishing gradually in size toward the distal end. Hydrothecæ campanulate, not very deep, with even rims. Hydranths with a web between the bases of the tentacles.



Gonosome.—Female gonangia very large and abruptly truncated above; male gonangia much smaller and more oval, but with no neck; sexual products forming planulæ before leaving gonangia.

Distribution.—Very abundant on floating seaweed, and rocks and timbers in shallow water. One of the most abundant species at Woods Hole.

OBELIA.

Trophosome.—Colony branched, stem simple or fascicled. Hydrothecæ campanulate, margin even, or toothed.

Gonosome.—Gonangia borne in axils of pedicels, usually oblong ovate, with terminal aperture usually surrounded with a collar or short neck. Medusæ with disk-shaped umbrella, 4 radial canals, more than 8 marginal tentacles, 8 lithocysts borne on bases of tentacles, and a short manubrium without mouth tentacles.

It is apparently impossible to define this genus so that it can be distinguished from *Campanularia* by the trophosome alone.



35. *Obelia flabellata* Hincks.



36. *Obelia commissuralis* McCr.

Key to the species of Obelia found in the Woods Hole region.

(A very careful manipulation of the microscope is often necessary before the characters of the hydrothecal margin can be definitely determined.)

A. Hydrothecal margin entire. Stem not fascicled.
  a. Colony a long central stem, giving off subverticillate branches which are themselves palmately branched.
    b. Hydrothecæ triangular. Pedicels usually with more than 6 annulations.....*O. flabellata.*
    b'. Hydrothecæ deeper, subtriangular. Pedicels often with more than 6 annulations.....*O. commissuralis.*
  a'. Colony irregularly branched; branches erect, often themselves branched. Hydrothecæ large, very deeply campanulate .....*O. dichotoma.*
  a''. Colony usually consisting of a single geniculate stem, giving off alternate pedicels which are supported on broad shoulders of the internodes from which they spring.....*O. geniculata.*
A'. Hydrothecal margin toothed. Stem fascicled.
  a. Teeth bimucronate, or castellated.
    b. Hydrothecæ triangular, without vertical lines.....*O. gelatinosa.*
    b'. Hydrothecæ deep, ornamented with vertical lines.
      c. Hydrothecæ deeply tubular. Pedicels with 6 to 15 annulations.....*O. bicuspidata.*
      c'. Hydrothecæ shorter. Pedicels with 3 to 6 annulations.....*O. bidentata.*
  a'. Teeth forming a series of exceedingly shallow undulations around the hydrothecal margin.....*O. longissima.*



Obelia flabellata (Hincks). Fig. 35.

(*Campanularia flabellata* Hincks., Ann. and Mag. Nat. Hist., 3d series, vol. XVIII, p. 297.)

Trophosome.—Colony 8 to 10 inches high, consisting of a central geniculate stem, giving forth branches which themselves branch in a flabellate manner; stem not fascicled, annulated above the origins of the branches. Pedicels borne on rather short processes or shoulders of the branches, distinctly annulated, short. Hydrothecæ triangular in outline, margin entire.

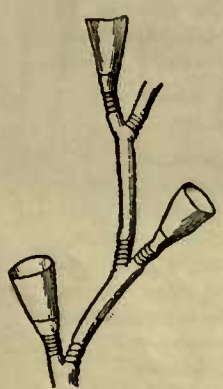
Gonosome.—Gonangia borne in axils of pedicels, oblong ovate, with a terminal collar and large round aperture. Medusæ not described, so far as I can ascertain.

Distribution.—Found in rocky tide pools (Hincks). Off Thimble Island, 4 to 5 fathoms. Woods Hole, in the passage (Verrill).

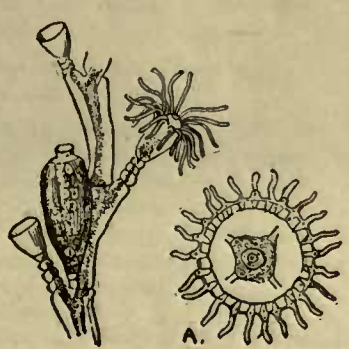
Obelia commissuralis McCr. Fig. 36.

(Proceedings Elliott Soc., vol. I, No. 1, p. 197.)

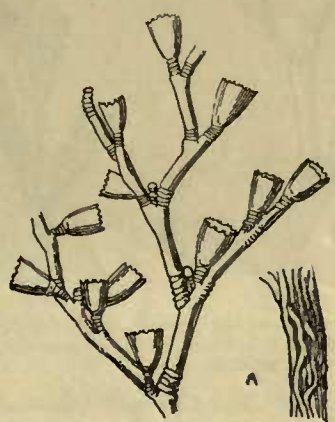
Trophosome.—Colony attaining a height of 6 to 8 inches, consisting of a central geniculate stem giving off branches as in *O. flabellata*. Pedicels not borne on distinct shoulders of the branches, distinctly annulated. Hydrothecæ campanulate, often subtriangular, but considerably deeper than in *O. flabellata*.



37. *Obelia dichotoma* (Linn.).



38. *Obelia geniculata* (Linn.).
A. Medusa.



39. *Obelia gelatinosa* (Pallas).
A. Portion of fascicled stem (enlarged).

Gonosome.—Gonangia much as in the last species, but larger and less distinctly ovoid. Medusæ at liberation with 16 marginal tentacles.

Distribution.—Growing profusely on docks and floating timbers. Abundant all along the New England coast.

The branching is exceedingly elegant and delicate, forming feathery verticillate tracery around the slender central stem.

Obelia dichotoma (Linn.). Fig. 37.

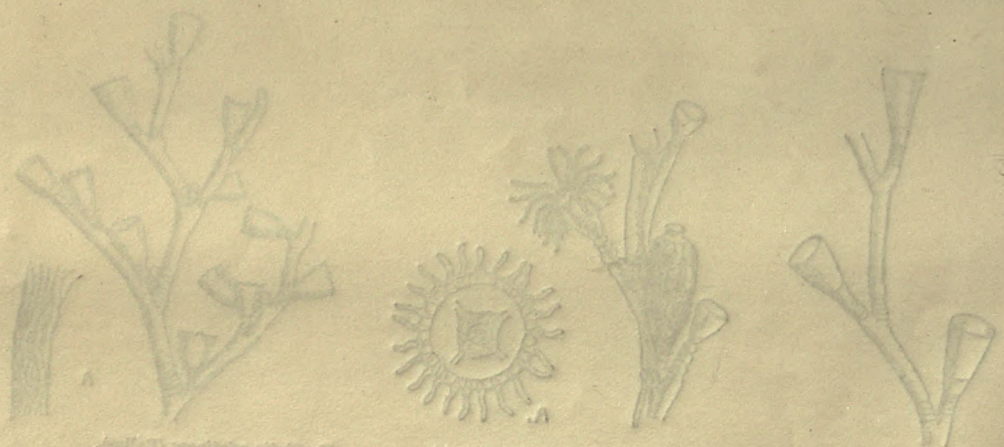
(*Sertularia dichotoma* Linn., Syst. Nat., p. 1312.)

Trophosome.—Colony branching irregularly, the branches tending to assume an erect posture, not subverticillate. Pedicels short, usually with 4 to 6 annulations, but sometimes with many. Hydrothecæ large, deeply campanulate, with straight sides and no teeth.

Gonosome.—Gonangia long, slender, widening toward distal end, and terminating in a beveled collar. Medusæ at liberation with 16 marginal tentacles.

Distribution.—Rather shallow water. Off Gay Head, 8 to 10 fathoms. (Verrill.)

I suspect that this is the same species as *Eucope pyriformis* A. Ag., but, not having seen his types, I can not be certain.



Obelia geniculata (Linn.). = *Eucope diaphana* L. Ag. (in part). = *Eucope alternata* A. Ag. Fig. 38.

(*Sertularia geniculata* Linn., Syst. Nat., p. 1312.)

Trophosome.—Colony usually consisting of a single geniculate stem bearing alternate pedicels on broad shoulder-like processes. Pedicels short, usually with 4 to 6 annulations. Hydrothecæ short, campanulate or subtriangular.

Gonosome.—Gonangia long, tapering gradually to basal end and terminating in a collar which is beveled and convex on its surface. Medusæ at liberation disk-shaped, with 24 marginal tentacles.

Distribution.—Growing profusely on docks, floating seaweed, etc. One of the commonest species in the Woods Hole region.

Obelia gelatinosa (Pallas). = *Laomedia gigantea* A. Ag. (*teste* Verrill). Fig. 39.

(*Sertularia gelatinosa* Pallas, Elenchus Zoophytorum, p. 116.)

Trophosome.—Colony sometimes attaining a height of 15 to 20 inches, profusely branched in a dendritic manner. Stem fascicled, with geniculate branches. Pedicels usually quite short, with 3 to 5 annulations. Hydrothecæ small, campanulate or subtriangular; margins armed with castellated or bimucronate teeth.

Gonosome.—Gonangia rather small, ovate, with collared aperture. Medusæ with 16 tentacles at time of liberation (Hincks).

Distribution.—Shallow water, often between tides, attached to timbers, etc. New Haven. Rhode Island coast. Vineyard Sound.

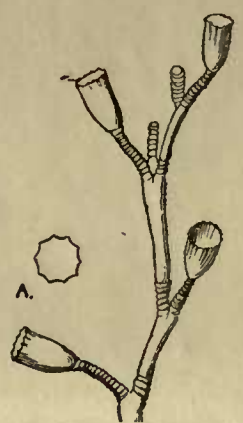
Obelia bicuspidata Clark. Fig. 40.

(Trans. Conn. Acad. of Sci., III, p. 58.)

Trophosome.—Colony attaining a height of about 33 inches. Stem fascicled, straight, irregularly branched. Pedicels longer than in the next species, and with 10 to 15 annulations. Hydrothecæ very deep, tubular, their margins armed with bimucronate teeth, between which lines originate which pass down the surface of the hydrothecæ.



40. *Obelia bicuspidata* Clark.



41. *Obelia longissima* Pallas. A. Outline of aperture of hydrotheca.

Gonosome.—Unknown.

Distribution.—Found at a depth of 3 to 5 fathoms, from reefs near Thimble Island. Near Woods Hole, 19 fathoms.

Obelia longissima (Pallas). Fig. 41.

(*Sertularia longissima* Pallas, Elenchus Zoophytorum, p. 119.)

Trophosome.—Colony attaining a height of 12 to 14 inches. Main stem fascicled, flexuose, giving off branches, which themselves branch in a palmate manner, the whole thus being subverticillate in effect. Pedicels of varying length, usually extensively annulated. Hydrothecæ rather deep, campanulate, the margins appearing at first sight to be without teeth, but upon careful examination proving to be armed with very shallow, regularly undulating teeth.

Gonosome.—Gonangia ovate, with collared apertures. Medusæ at the time of liberation with 20 to 24 tentacles (Hincks).

Distribution.—Woods Hole. Off Gay Head. Dredged by the *Fish Hawk* at station 7051, about 40 miles southeast of No Mans Land; depth, 3 fathoms.

As described by Hincks, this species has not a fascicled stem. Authentic specimens from England, however, have distinctly fascicled stems, and agree well with American specimens.

Obelia bidentata Clark.

(Trans. Conn. Acad. of Sci., III, p. 58.)

Trophosome.—Like that of *O. biscuspidata*, except that it attains a larger size, has shorter pedicels, with 4 to 6 annulations, and proportionately wider hydrothecæ.



Gonosome.—Unknown.

Distribution.—On piles, Greenport, Rhode Island.

I have a specimen that to a certain extent intergrades between this species and the preceding, and therefore suspect that the two species may be identical.

GONOTHYRÆA.

Trophosome.—Stem not fascicled, branched. Hydrothecæ campanulate, with toothed margins.

Gonosome.—The gonangia producing fixed, medusiform sporosacs with apical filiform tentacles. The sporosacs, when nearly mature, pass out of the gonangium and remain attached to its top until the spermatozoa or planulæ are discharged.

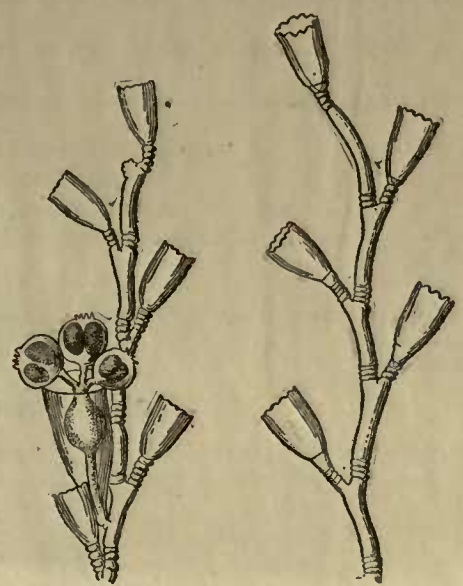
Gonothyræa loveni Allman. Fig. 42.

(Ann. and Mag. of Nat. Hist., 3d series, vol. 13, p. 374.)

Trophosome.—Stem irregularly branched, attaining a height of one-half to three-fourths inch, slightly flexuose, annulated above origins of pedicels. Pedicels short, with 2 to 5 annulations. Hydrothecæ deeply campanulate, gracefully tapering toward base, very thin and transparent around margin, which is quite variable in its dentition, the typical teeth being turreted and squared at the ends.

Gonosome.—Gonangia large, long, obconic, borne in the axils of the pedicels, each bearing, when mature, 3 to 5 sporosacs or modified medusæ on its summit. The sporosacs are attached to the top of the gonangium by short pedicels, and have at their upper end a circlet of short tentacles. They discharge their contents before becoming free.

Distribution.—On shells, stones, etc., in shallow water. Dr. H. C. Bumpus sent the writer some beautiful specimens from the coast of Rhode Island.



42. *Gonothyræa loveni* Allm. 43. *Gonothyræa tenuis* Clark.

Gonothyræa tenuis Clark, fig. 43, is reported from New Haven. There is no point either in the original description or in the figure published by Dr. Clark that enables me to separate this species from typical specimens of *G. loveni* from England. Professor Verrill says of this species: "Closely allied to *G. loveni*, but has narrow, elongated, obconic gonothecæ." As these terms are precisely applicable to the gonangia of *G. loveni*, I can not perceive any basis for considering *G. tenuis* a good species.

Gonothyræa hyalina Hincks is also reported by Professor Verrill as occurring off Watch Hill, Rhode Island. The writer, while at Plymouth, England, found completely intergrading specimens between this species and *G. loveni*.

HEBELLA (modified).

Trophosome.—Pedicels arising from a creeping rootstock. Hydrothecæ tubular, with entire margins and without operculæ. Hydrothecal cavity separated from that of the pedicel by a partial septum. Hydranth with a conical proboscis.

Gonosome.—Gonangia producing free medusæ.

The genus as here defined would include several species which most authors place in the genus *Lafœa*.

Key to species of Hebella found in the Woods Hole region.

Hydrothecæ usually in pairs, doubly curved. Species almost always parasitic on *Sertularia cornicina* ..... *H. calcarata.*
Hydrothecæ irregularly distributed, small, not doubly curved. Species parasitic on various hydroids..... *H. pygmæa.*



Hebella calcarata (A. Ag.). Fig. 56.

(*Lafœa calcarata* A. Ag., North American Acalephæ, p. 122.)

Trophosome.—Colony parasitic, almost always on *Sertularia cornicina*, where it assumes a symmetrical mode of growth, the main stem growing straight up the front of the host and giving forth a pair of hydrothecæ immediately above each pair of the sertularian hydrothecæ. Pedicels very short and slender. Hydrothecæ large, curved outward, backward and upward; margin circular, entire. Hydranth with a conical hypostome and about 16 tentacles.

Gonosome.—Gonangia very large, borne on pedicels between the pairs of hydrothecæ. Medusæ at birth deeply campanulate, with two long marginal tentacles, and others in course of development; 4 radial canals and yellow-spotted proboscis.

Distribution.—Found attached to *Zostera* at Woods Hole by Mr. Walmsley. Vineyard Sound, 1 to 8 fathoms (Verrill).

This species was originally described by McCrady as a part of the sertularian on which it grows

Hebella pygmæa (Alder) MS. Fig. 44.

(See British Hydroid Zoophytes, p. 205.)

Trophosome.—Pedicels springing direct from a simple creeping rootstock, very short, annulated. Hydrothecæ minute, cylindrical, deep; aperture smooth, sometimes somewhat oblique, as in figure.

Gonosome.—Unknown.

Distribution.—Found on a polyzoon off Nantucket; Sankety Light east by south, 24 fathoms; depth, 24 fathoms. (Vinal Edwards.)

This minute species is identified with considerable doubt.



44. *Hebella pygmæa* (Alder).

CAMPANULINIDÆ (modified).

Trophosome.—Colonies branched or unbranched. Hydrothecæ borne on pedicels, tubular, ending in an operculum composed of converging segments. Hydranths with a conical proboscis.

Gonosome.—Gonangia producing planulæ, or free medusæ.

This family is here modified to include the genera *Lovenella* and *Calycella*, the former having heretofore been placed in the *Campanularidæ* and the latter in the *Lafœidæ*. Both agree with the genus *Campanulina* in having hydrothecæ with a segmented operculum and hydranths with a conical proboscis.

Key to genera of Campanulinidæ of Wood Hole region.

A. Colony usually branched.
  a. Hydrothecæ large, subcylindrical, with a well-defined sinuous margin at base of segmented operculum .... *Lovenella*
  a′. Hydrothecæ much smaller, ovate in outline, the margin passing in sensibly into the segments of operculum ..... *Calycella*
A′. Colony not regularly branched. Hydrothecæ not sessile tubular, often with reduplicated margins ..... *Opercularella*
A″. Colony not branched. Hydrothecæ sessile, tubular ..... *Cuspidella*



45. *Lovenella grandis* Nutting.

LOVENELLA.

Trophosome.—Colony branched. Hydrothecæ deep, with a distinct sinuous margin crowned with operculum composed of several triangular segments which form a pointed covering to hydrotheca.

Gonosome.—Gonangia borne on the stems and producing free, bell-shaped medusæ with 8 tentacles in two sets, and 4 lithocysts.



Lovenella grandis, new species. Fig. 45.

Trophosome.—Stem simple, giving off regularly alternating, short, annulated pedicels, one from each internode. Hydrothecæ very large, cylindrical; margin with 10 regular sinuations from which arise the 10 sharply pointed segments of the operculum. Hydranths large, with a conical proboscis which becomes dome-shaped on retraction, and about 16 rather rigid tentacles.

Gonosome.—Not known.

Distribution.—Dredged from Newport Harbor, off Castle Hill.

This beautiful species was given me for description by Mrs. Virginia Barrett Gibbs, of Newport.

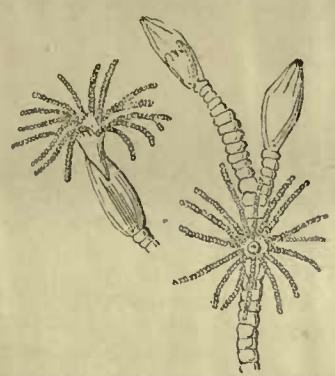
OPERCULARELLA.

Trophosome.—Stem annulated throughout. Hydrothecæ ovate in outline, the margin not distinct, the segments of the operculum appearing to be very thin and greatly elongated marginal teeth which converge to form the operculum.

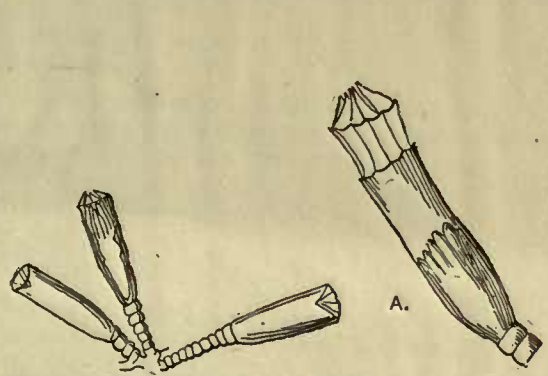
Gonosome.—The mature gonangia bear acrocysts.

Key to species of Operculariella found in the Woods Hole region.

Hydrothecæ larger, with more deeply cleft segments of the opercula.....*O. lacerata.*
Hydrothecæ smaller, with less deeply cleft segments of the opercula.....*O. pumila.*



46. *Operculariella lacerata* Hincks.



47. *Calycella syringa* (Linn.). A. Hydrotheca (enlarged).

Operculariella lacerata Hincks. Fig. 46.

(British Hydroid Zoophytes, p. 194.)

Trophosome.—Stem annulated throughout, sparsely branched, or unbranched. Hydrothecæ with short pedicels, oblong ovate in outline; opercular segments 8 to 10, very long and slender, somewhat curved. Hydranth with conical proboscis and about 16 tentacles.

Gonosome.—Gonangia large, ovate, borne on ringed pedicels, and, when mature, bearing globular acrocysts on their summits.

Distribution.—New Haven, Conn., on piles of Long Wharf. (Clark.)

Operculariella pumila Clark.

(Trans. Conn. Acad., vol. III, p. 61.)

Like *O. lacerata*, but with smaller hydrothecæ, and less deeply cleft segments of the operculum.

In comparing Dr. Clark's description and figure with sketches of *O. lacerata* made by myself in England I have serious doubts as to the validity of the former species, but consider it best to let it stand here, as I have not seen the type specimens.



CALYCELLA.

Trophosome.—Stem a creeping root-stock parasitic on other species of hydroids, polyzoons, etc., sending forth short annulated pedicels bearing tubular hydrothecæ with distinct, segmented opercula.

Gonosome.—Gonangia oval, borne on the root-stock, and, when mature, bearing globular acrocysts.

Calycella syringa (Linn.). Fig. 47.

(*Sertularia syringa* Linn., Syst. Nat., p. 1311.)

Trophosome.—Pedicels shorter than hydrothecæ, very deeply annulated. Hydrothecæ tubular, with thick horn-colored walls and slightly sinuated margins; opercular segments rather short, triangular, and capable of being drawn into the hydrotheca when the hydranth is retracted. There is often a sort of an addition or tubular extension beyond the end of the hydrotheca, with a distinct margin bearing the opercular segments.

Gonosome.—Gonangia oval, borne on short annulated pedicels and, when mature, with globular acrocysts.

Distribution.—Found abundantly in the Woods Hole region, growing over all sorts of plant-like marine organisms, especially other hydroids.

CUSPIDELLA.

Trophosome.—Hydrothecæ sessile with a conical operculum. Hydranths with a conical hypostome.

Gonosome.—Not known.

Cuspidella costata Hincks.

(British Hydroid Zoophytes, p. 210.)

Trophosome.—Hydrothecæ perfectly cylindrical and sessile, encircled with usually three sharply defined annulations dividing the hydrotheca externally into four zones; operculum composed of numerous segments, the distal ends of which can be retracted within the hydrotheca.

Gonosome.—Unknown.

Distribution.—Reported by Professor Verrill from Fisher Island Sound, 9 to 11 fathoms.

This species is identified with doubt by Verrill.

LAFŒIDÆ (modified).

The modification consists of the removal of the small monosiphonic species, such as *Lafœa pocillum*, which I have placed in Allman's genus *Hebella*, and the genus *Calycella*, which I have placed in the family *Campanulinidæ*.

Trophosome.—Stem fascicled. Hydrothecæ tubular, without a partial septum dividing the hydrothecal cavity from that of the pedicel; margin without teeth or opercula. Hydranths with a conical proboscis.

Gonosome.—Gonangia found in compact masses incrusting the fascicled stem, oblong, each female gonangium containing a single ovum. The gonosome of *Lafœa* was long regarded as a distinct hydroid organism under the name *Coppinia arcta*.[1]

LAFŒA.

This being the only genus of *Lafœidæ* found on the New England coast, it can be identified by the family characters as given above.

Key to the species of Lafœa found in the Woods Hole region.

Hydrothecæ short, almost sessile ..... *L. dumosa.*
Hydrothecæ slender, with distinct pedicels which are waved or twisted ..... *L. gracillima.*

Lafœa dumosa Fleming. Fig. 48.

(Phil. Journ., II, p. 83.)

Trophosome.—Stem simple, in the form of a creeping root-stock, or compound and erect. Hydrothecæ strong, large, tubular, with short, sometimes hardly evident, pedicels.

[1] See New Hydroids from Alaska and Puget Sound, C. C. Nutting. Proc. U.S.N.M., vol. XXI, p. 747.

Page 1, line 1, for "Hydroids" read "Hydroids, polyzoons, etc."

Page 1, line 2, for "Hydroids" read "Hydroids, Annelids, crustaceans, Echinoderms, Tunicates, and other marine animals, bearing globular ectocysts."

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Gonosome.—Gonangia in masses, incrusting the fascicled stem, so closely crowded as to be pressed together, tubular or oblong oval with short bottle-shaped necks. Both sexes found in the same colony.

Distribution.—Found growing on other hydroids on Nantucket Shoals. (Verrill.)

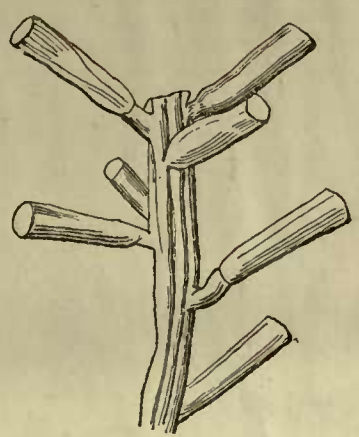
Lafœa gracillima (Alder.) Fig. 49.

(*Campanularia gracillima*, Cat. Zooph. Northumb. and Durham, p. 39.)

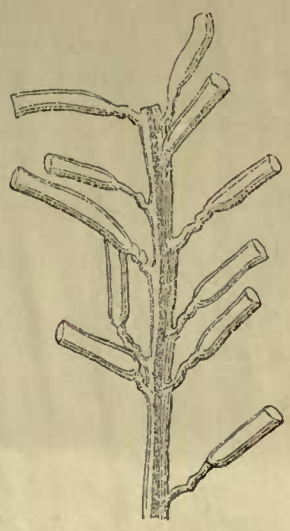
Trophosome.—Stem erect, fascicled, often irregularly branched. Pedicels slender, sinuous or apparently twisted. Hydrothecæ very slender, delicate in texture, often slightly curved.

Gonosome.—Much like that of *L. dumosa*, and heretofore known as *Coppinia arcta*.

Distribution.—Reported from the New England coast by Professor Verrill. Although not specifically reported from the Woods Hole region, it doubtless occurs there, as its distribution is much like that of *L. dumosa*.



48. *Lafœa dumosa* (Fleming).



49. *Lafœa gracillima* (Alder).

HALECIDÆ.

Trophosome.—Hydrothecæ alternate, reduced to the form of saucer-shaped hydrophores, usually borne on tubular pedicels; margins even, often reduplicated several times, and surrounded by a circlet of bright, bead-like dots. Hydranths large, with conical proboscis, not capable of retracting within the hydrophores.

Gonosome.—Gonangia producing planulæ, and usually different in the two sexes, that of the female often being surmounted by a pair of hydranths.

HALECIUM.

The single genus can be identified by the characters given above.

Key to species of Halecium found in the Woods Hole region.

A. Hydrophores borne on distinct pedicels.
  a. Stem fascicled.
    b. Colony flabellate in form; aperture of female gonangium terminal, but not central. Pedicels short ..... *H. halecinum.*
    b'. Colony dendritic in form. Female gonangia with round lateral apertures. Pedicels short ..... *H. beani.*
    b''. Colony with slender branches. Female gonangia as in *H. halecinum*, but with the end emarginate ..... *H. gracile.*
  a'. Stem not fascicled, irregularly branched, annulated ..... *H. tenellum.*
A'. Hydrophores sessile, borne directly on broadened shoulder of internodes of stem ..... *H. articulosum.*



Haleeium halecinum (Linn.). Fig. 50.

(*Sertularia halecina* Linn., Syst. Nat., p. 1308.)

Trophosome.—Colony attaining a height of 6 to 10 inches, erect, rigid; stem fascicled, pinnately branched, internodes short. Hydrophores on long trumpet-shaped pedicels, margins frequently reduplicated.

Gonosome.—Female gonangia in rows on upper side of branches, obconic in outline, with the aperture on one side of the truncated top, surrounded by a collar-like rim surmounted by a pair of hydranths. Male gonophores slender, oblong-ovate.

Distribution.—Abundant throughout the Woods Hole region, growing on shells, stones, etc., in shallow water.

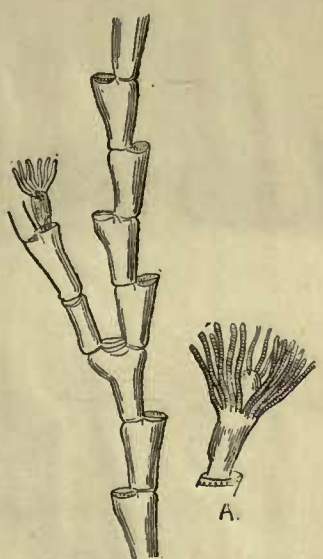
Halecium articulosum Clark. Fig. 51.

(Trans. Conn. Acad. of Sci., vol. III, p. 63.)

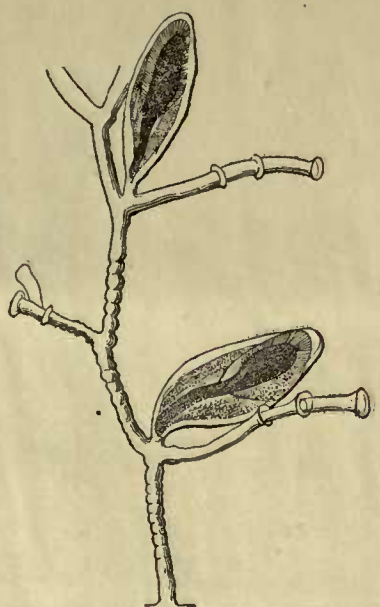
Trophosome.—Colony sometimes attaining a height of almost 2 feet; stem fascicled, branches very long and slender, the ultimate branchlets being pinnately arranged like those of the family *Plumularidæ*. Hydrophores sessile, alternate, borne on the broadened distal ends of the almost triangular internodes. Hydranths very large, with about 20 tentacles.



50. *Halecium halecinum* (Linn.). Gonangium bearing Hydranths.



51. *Halecium articulosum* Clark. A. Hydranth (enlarged).



52. *Halecium tenellum* Hincks.

Gonosome.—Female gonangia obovate, with a latero-terminal aperture. Male gonangia long, slender, subcylindrical.

Distribution.—Long Island Sound (Ferrill). The gigantic specimens referred to were secured by the *Fish Hawk*, station 7051, lat. N. 40° 46′; long. W. 70° 43′. Depth 31 fathoms. The largest specimen, and it is probably the largest known specimen of the *Haleciдæ*, is now in the U. S. Fish Commission collection at Woods Hole.

Halecium tenellum Hincks. Fig. 52.

(Ann. and Mag. of Nat. Hist., 3d. series, vol. VIII, p. 252.)

Trophosome.—Colony very small, not over half an inch in height; stem not fascicled, delicate, irregularly geniculate; branches straggling, irregular; internodes very long and irregularly annulated. Hydrophores borne on very long, tubular pedicels, irregularly arranged.

Gonosome.—Gonangia borne at origin of pedicels, very large, oblong-ovate in outline.

Distribution.—I find this species mentioned in my notes as occurring at Woods Hole, but the specimen seems to have been lost. The figure is from an English specimen.



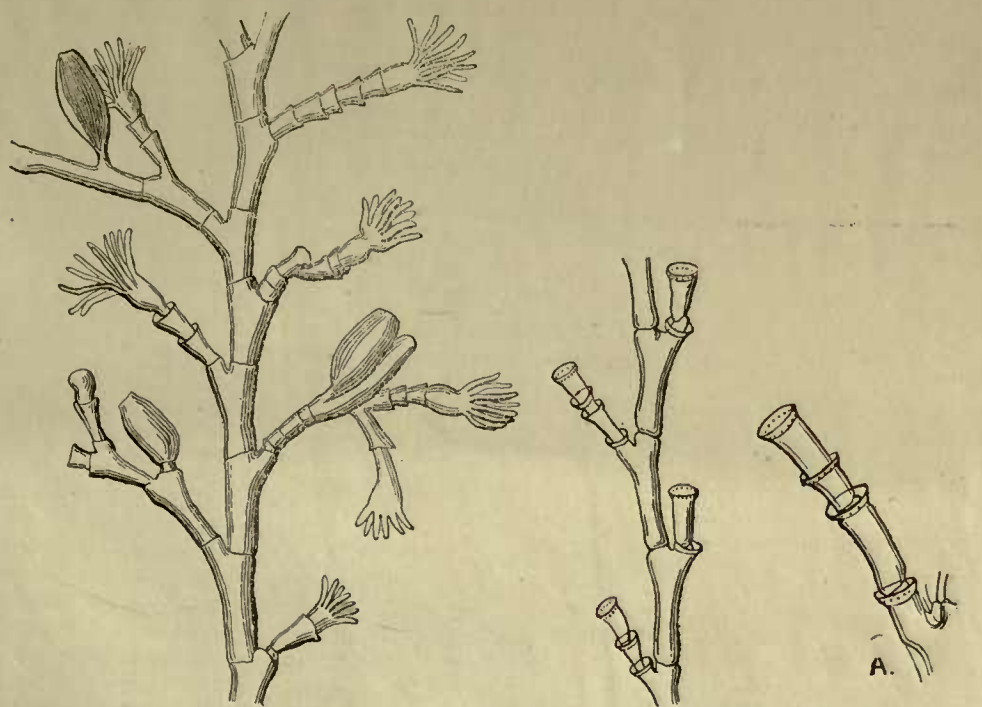
Halecium beani (Johnston). Fig. 53.

(*Thoa beani* Johnston, British Zoophytes, p. 120.)

Trophosome.—Colony 2 to 5 inches high, branching in a dendritic manner, more delicate than *H. halecinum;* stem fascicled, branches slender,. the internodes divided by slightly oblique nodes. Hydrophores much as in *H. halecinum.*

Gonosome.—Female gonangia mitten-shaped, with the aperture lateral, representing the cut-off thumb of the mitten. Male gonangia oblong-ovate.

Distribution.—Found growing on bivalve shells at Woods Hole.



53. *Halecium beani* (Johnston).

54. *Halecium gracile* Verrill.
A. Hydrophores (enlarged).

Halecium gracile Verrill. Fig. 54.

(Invertebrated Animals of Vineyard Sound, p. 729.)

Trophosome.—Colony profusely branched; stem fascicled; branches ascending, slender, pinnately arranged, with slender internodes separated by oblique nodes. Hydrophores much as in *H. halecinum.*

Gonosome.—Female gonangia much as in *H. halecinum,* but with the end emarginate. Male gonangia oblong-ovate.

Distribution.—Buzzard's Bay; Vineyard Sound; near New Haven, on floating timber (Verrill).

Professor Verrill has kindly sent me a type specimen from which the figures were drawn. Although hard to differentiate succinctly from *H. halecinum,* it has a very distinct facies and mode o growth.



SERTULARIDÆ.

Trophosome.—Hydrothecæ sessile, more or less adnate to the stem, and arranged on both sides of the stem and branches. Hydranths with conical proboscis and a single whorl of filiform tentacles.

Gonosome.—Gonangia producing planulæ. No medusæ.

Key to the genera of Sertularidæ found in the Woods Hole region.[1]

A. Hydrothecæ in strictly opposite pairs, a pair to each internode of the stem or branch.
  a. Operculum, when present, in two pieces.....*Sertularia.*
  a'. Operculum, when present, in one piece only.....*Diphasia.*
A'. Hydrothecæ, subopposite, usually deeply immersed, more than two to each joint of stem or branch.....*Thuiaria.*
A''. Hydrothecæ strictly alternate.
  a. Hydrothecæ placed on opposite sides of stem and branches.....*Sertularella.*
  a'. Hydrothecæ placed on the front of branches and curved alternately to the right and left.....*Hydrallmania.*

SERTULARIA.

Trophosome.—Colony usually branched; stems and branches divided into regular internodes, each of which bears a pair of strictly opposite hydrothecæ. Hydrothecæ either without an operculum or with a very delicate one composed of two pieces.

Gonosome.—Gonangia without an internal marsupium.

Key to species of Sertularia found in the Woods Hole region.

A. The two hydrothecæ composing a pair scarcely touching each other in front.....*S. pumila*
A'. The two hydrothecæ in contact for at least half their length.
  a. The width of a pair of hydrothecæ at their bases considerably less than distance from bottom of hydrothecæ to the node below.....*S. cornicina.*
  a'. The width of a pair of hydrothecæ at their bases not much less than distance from bottom of hydrothecæ to the node below.....*S. complexa.*

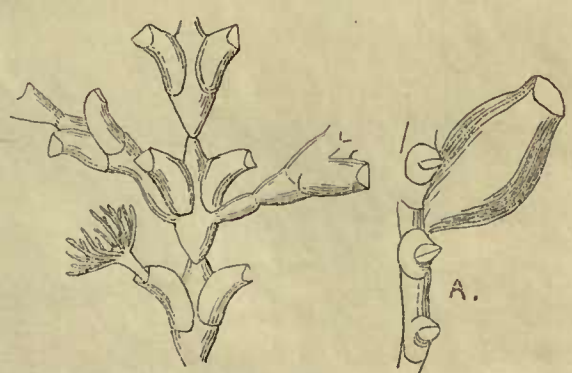
Sertularia pumila Linn. Fig. 55.

(Syst. Nat., p. 1306.)

Trophosome.—Colony small, branched or unbranched; stem divided into regular internodes, each bearing a pair of hydrothecæ. Hydrothecæ stout, regularly curved, the approximated sides of a pair not in contact; aperture bilabiate, often showing a very delicate operculum composed of two valves.

Gonosome.—Gonangia ovate, with a short pedicel and a terminal collar containing the aperture.

Distribution.—Rather common in the Woods Hole region in shallow water. Often found growing over seaweed.



55. *Sertularia pumila* Linn.
A. Side view of branch bearinggenangium.

Sertularia cornicina (McCr.). Fig. 56.

(*Dinamena cornicina* McCr., Gymnophthalmata of Charleston Harbor, p. 204.)

Trophosome.—Colony usually of a single upright stem not over half an inch high. Hydrothecæ more slender than in *S. pumila* and the pairs are in contact for a considerable part of their contiguous sides. Colony almost invariably overgrown by a campanularian (*Hebella calcarata*) which the original describer took to be a part of the sertularian, the campanularian disposing its curved tubular hydrothecæ symmetrically in pairs above the pairs of hydrothecæ of the sertularian.

Gonosome.—Unknown.

Distribution.—Vineyard Sound, 8 fathoms on *Halecium gracile*, and on *Zostera* (Verrill). My specimens were sent by Mr. Walmsley to Professor Osborn, of Hamline University, labeled "*S. pumila.*"

[1] A satisfactory classification of this group is still to be devised. The one adopted here will do fairly well for the genera and species in the territory under consideration, but would be unsatisfactory if applied to the *Sertularidæ* in general.

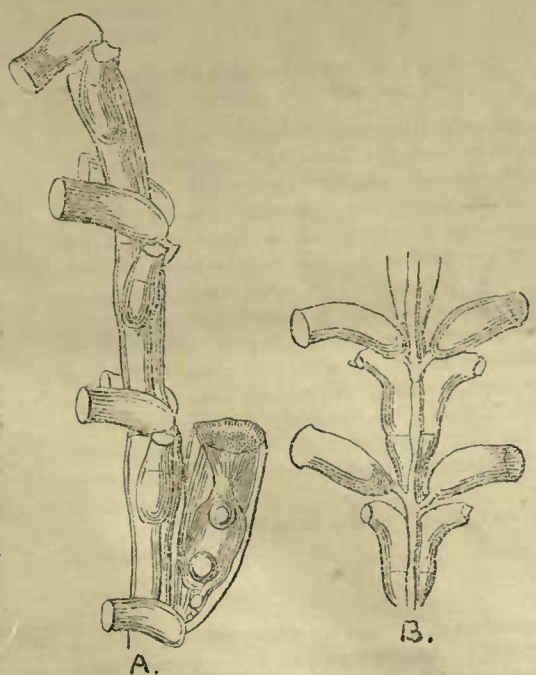
Sertularia complexa Clarke. Fig. 57.

(Bull. Mus. Comp. Zool., vol. v, No. 10, p. 245.)

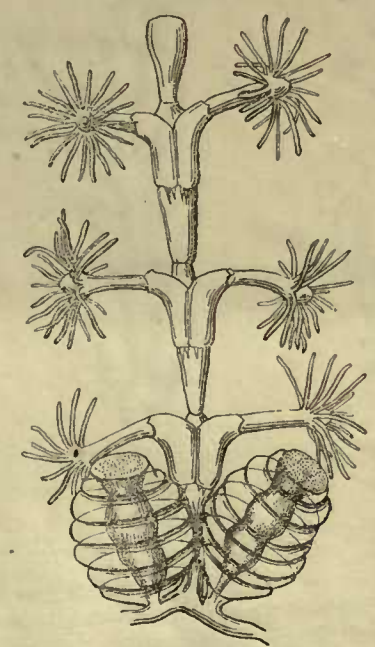
Trophosome.—Colony an unbranched erect stem attaining a height of about three-fourths inch. Hydrothecæ tubular, abruptly curved outward distally, aperture bilabiate; the two hydrothecæ of a pair adnate for more than their proximal half. Stem internodes below hydrothecæ slender, showing immediately below the hydrothecæ short internal, chitinous processes pointing downward from the hydrothecal floors. Hydranths with conical proboscis and about 20 tentacles.

Gonosome.—Gonangia produced usually in pairs at foot of stem, ovoid in form, beautifully and regularly annulated, resembling Chinese lanterns, collar terminal, with circular aperture and operculum.

Distribution.—Found by Mr. Walmsley near Woods Hole, and afterwards by myself, growing in great quantities over seaweed dredged from the bottom near Nobska Point.



56. *Sertularia cornicina* McCr., upon which *Hebella calcarata* (Ag.) is growing as a parasite.
A. Lateral view. B. Front view.



57. *Sertularia complexa* Clarke.

This interesting species was originally found by the *Blake* off the coast of Yucatan, then reported from Australia by Professor Bale, and finally proves to be common near Woods Hole, where it has doubtless often been mistaken for *S. pumila*.

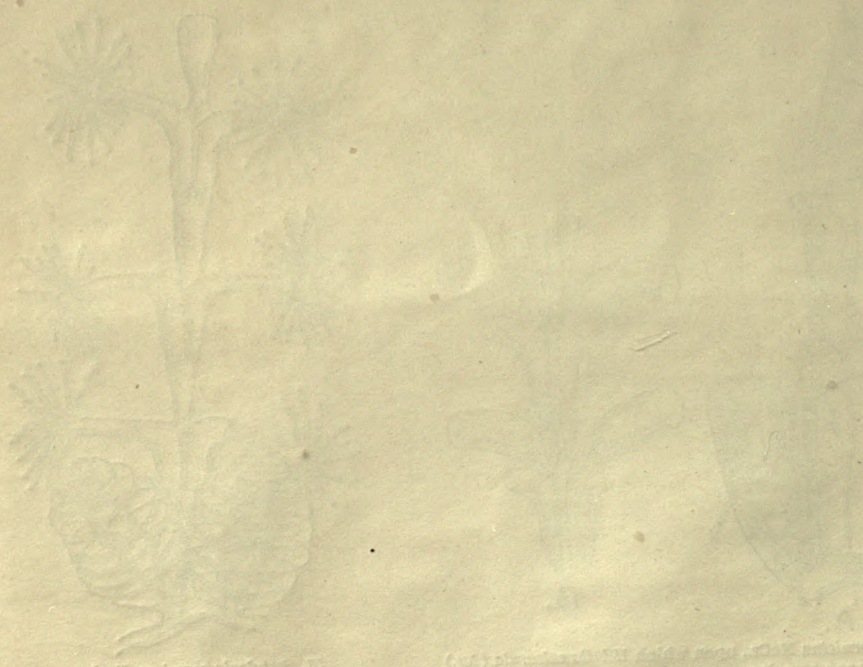
DIPHASIA.

Trophosome.—Colony regularly branching; stems and branches regularly divided into internodes, each of which bears a pair of opposite hydrothecæ. Hydrothecal margins even or sinuous, with an internal operculum consisting of a single piece.

Gonosome.—Gonangia cleft above into leaf-like segments, and containing a spherical, internal marsupial chamber.

Key to species of Diphasia found in the Woods Hole region.

Width of a pair of hydrothecæ at base nearly equal to their length.....*D. fallax.*
Width of a pair of hydrothecæ at base not much more than half their height.....*D. rosacea.*



Diphasia fallax (Johnston). Fig. 58.

(*Sertularia fallax* Johnston, British Zoophytes, 8th edition, p. 127.)

Trophosome.—Colony branched, the terminal branches often abruptly curved so as to form a hook or short coil. Hydrothecæ stout, with a wide, sinuous margin closed by an operculum hinged to its inner side.

Gonosome.—Female gonangia with four leaf-like expansions above; male gonangia with four terminal spines.

Distribution.—Shallow water, often growing on other hydroids. A specimen found in the U. S. Fish Commission collection at Woods Hole is labeled "E. by S., Sankety, Nantucket, 23 fathoms, V. N. E." Off Watch Hill, 17 to 21 fathoms. (Verrill.)

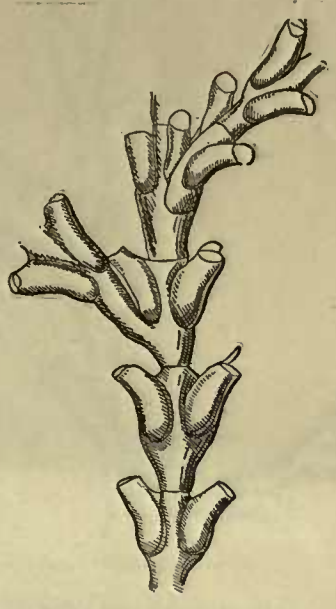
Diphasia rosacea (Linn.). Fig. 59.

(*Sertularia rosacea* Linn., Syst. Nat., 1306.)

Trophosome.—Colony branched; branches more slender than in *D. fallax*, and more widely separated. Hydrothecæ delicate, transparent, slender, tubular, abruptly bent outward near the middle; aperture facing nearly upward, sinuous, closed with an internal operculum consisting of a single piece.

Gonosome.—Female gonangium pyriform, longitudinally ridged, with two prominent pointed processes on top, and a round internal marsupium; male gonangium "pyriform, curved toward the base, traversed by longitudinal lamellated ridges, which rise above into spinous processes around a slender tubular orifice." (Hincks.)

Distribution.—Fisher Island Sound, 9 to 11 fathoms. (Verrill.)



58. *Diphasia fallax* (Johnston).



59. *Diphasia rosacea* (Linn.).

SERTULARELLA.

Trophosome.—Colony usually branching; stem and branches divided into regular internodes, each bearing one or two hydrothecæ. Hydrothecæ strictly alternate, borne on opposite sides of the branch, usually with toothed margins provided with an operculum consisting of more than one piece.

Gonosome.—Gonangia as in *Sertularia*, but usually more or less annulated.

Key to species of Sertularella found in the Woods Hole region.

A. Hydrothecal margin without teeth or operculum ..... *S. abietina.*
A′. Hydrothecal margin with three teeth ..... *S. tricuspidata.*
A¹. Hydrothecal margin with 4 teeth.
  a. Teeth obscure. Hydrothecæ fusiform, deeply annulated or wrinkled transversely ..... *S. rugosa.*
  a′. Hydrothecæ very large, sometimes corrugated above. Branches approximate ..... *S. gayi.*
  a″. Hydrothecæ medium-sized, smooth. Branches irregular and distant ..... *S. tricuspidata.*

Sertularella abietina (Linn.). Fig. 60.

Trophosome.—Colony pinnately branched; branches thick and coarse, approximate, divided into internodes, each of which bears one or two hydrothecæ; nodes oblique. Hydrothecæ large, alternate, bulging below and narrowing above to a tubular neck with a round, even aperture without an operculum.

[1] *Sertularia abietina* Linn., Syst. Nat., p. 1307.



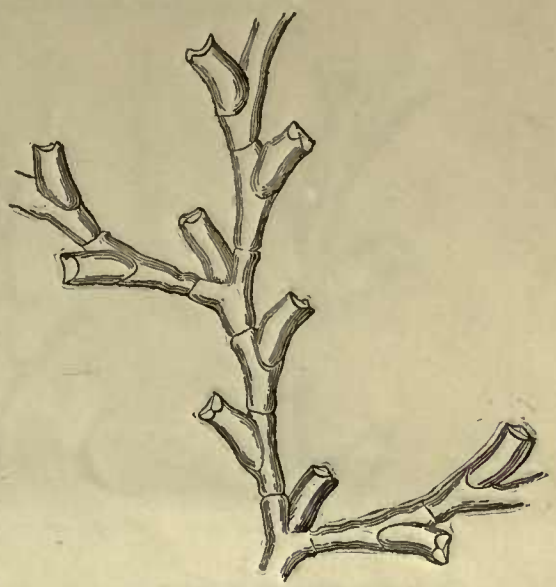
Gonosome.—Gonangia "subsessile, ovate, smooth, with an even, shortly tubulous mouth." (Hincks.)

Distribution.—A specimen in the U. S. Fish Commission collection at Woods Hole bears the label: "E. by S., Sankety light, 20 fath."

This species has always hitherto been placed in the genus *Sertularia*. Its strictly alternate hydrothecæ, however, make it necessary to consider it a *Sertularella* in accordance with the definition given above.



60. *Sertularella abictina* (Linn.).



61. *Sertularella tricuspidata* (Alder).

Sertularella tricuspidata (Alder). Fig. 61.

(*Sertularia tricuspidata* Alder, Cat. Zooph. North and Durh., p. 21.)

Trophosome.—Colony slender, branches alternate, divided into regular internodes, each of which bears a hydrotheca. Hydrothecæ cylindrical, slightly curved, distant, with a 3-toothed margin and 3-parted operculum.

Gonosome.—Gonangia deeply ringed, ovate, with a constricted tubular neck and circular orifice.

Distribution.—A specimen in the Fish Commission collection at Woods Hole bears the label "E. by S., Sankety light, 25 fath."

Sertularella rugosa (Linn.). Fig. 62.

(*Sertularia rugosa* Linn., Syst. Nat., p. 1308.)

Trophosome.—Colony minute, unbranched, or sparingly branched; internodes short, each bearing a hydrotheca. Hydrothecæ fusiform, very deeply and conspicuously marked with annular corrugations; aperture quadrangular, rather obscurely toothed; teeth, 4; operculum composed of 4 pieces.

Gonosome.—Gonangia like the hydrothecæ, but much larger.

Distribution.—Noank, on piles of wharf. Off Watch Hill, 17 to 21 fathoms. (Verrill.)

Sertularella polyzonias (Linn.). Fig. 63.

(*Sertularia polyzonias* Linn., Syst. Nat., p. 813.)

Trophosome.—Colony branched in an irregular manner, the branches alternate, but not equally distant, divided into regular internodes, each of which bears a hydrotheca; nodes oblique. Hydrothecæ swollen below, narrowing above to a margin, with 4 shallow teeth and an operculum of 4 pieces.

Gonosome.—Gonangia ovate, corrugated, with a short pedicel and quadrate aperture.

Distribution.—"Off New London, 6 fath.; Gardener Bay, 6 to 8 fathoms; Block Island Sound, 17 to 24 fathoms." (Verrill.)



Sertularella gayi (Lamx.). Fig. 64.

(*Sertularia gayi* Lamx., Exposition Méthodique, p. 12.)

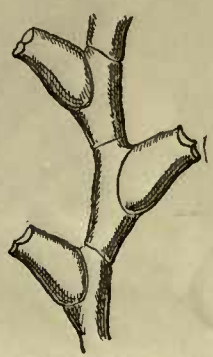
Trophosome.—Like the last, but much more robust. Branches regularly pinnate and approximate. Hydrothecæ much larger, often corrugated on the upper side.

Gonosome.—Gonangia with a 2-toothed aperture.

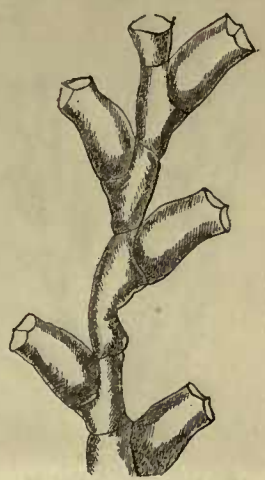
Distribution.—A specimen in the U. S. Fish Commission collection at Woods Hole bears the label "E. by S., Sankety Light, Nantucket, 25 fath." This specimen has much larger and coarser hydrothecæ than specimens from England, and may represent a distinct species.



62. *Sertularella rugosa* (Linn.).



63. *Sertularella polyzonias* (Linn.).



64. *Sertularella gayi* (Linn.).

THUIARIA.

Trophosome.—Colony branched; stem and branches divided into internodes each of which bears more than two opposite or subopposite hydrotheæ which are usually deeply immersed in the stem. Hydrothecæ tubular, or flask-shaped, with bilabiate apertures.

Gonosome.—Gonangia much like those of *Sertularia*.

Key to species of Thuiaria found in the Woods Hole region.

A. Stem long and slender, bearing slender branches which subdivide dichotomously. Gonangia bimucronate.
  a. Hydrothecæ free for about their distal one-third ..... *T. argentea.*
  a'. Hydrothecæ immersed almost to the orifice ..... *T. cupressina.*
A''. Stem and branches rigid, the latter stiff and subverticillately arranged. Gonangia without mucronate processes on end ..... *T. thuja.*

Thuiaria argentea (Ellis & Solander). Fig. 65.

(*Sertularia argentea* Zooph., p. 38.)

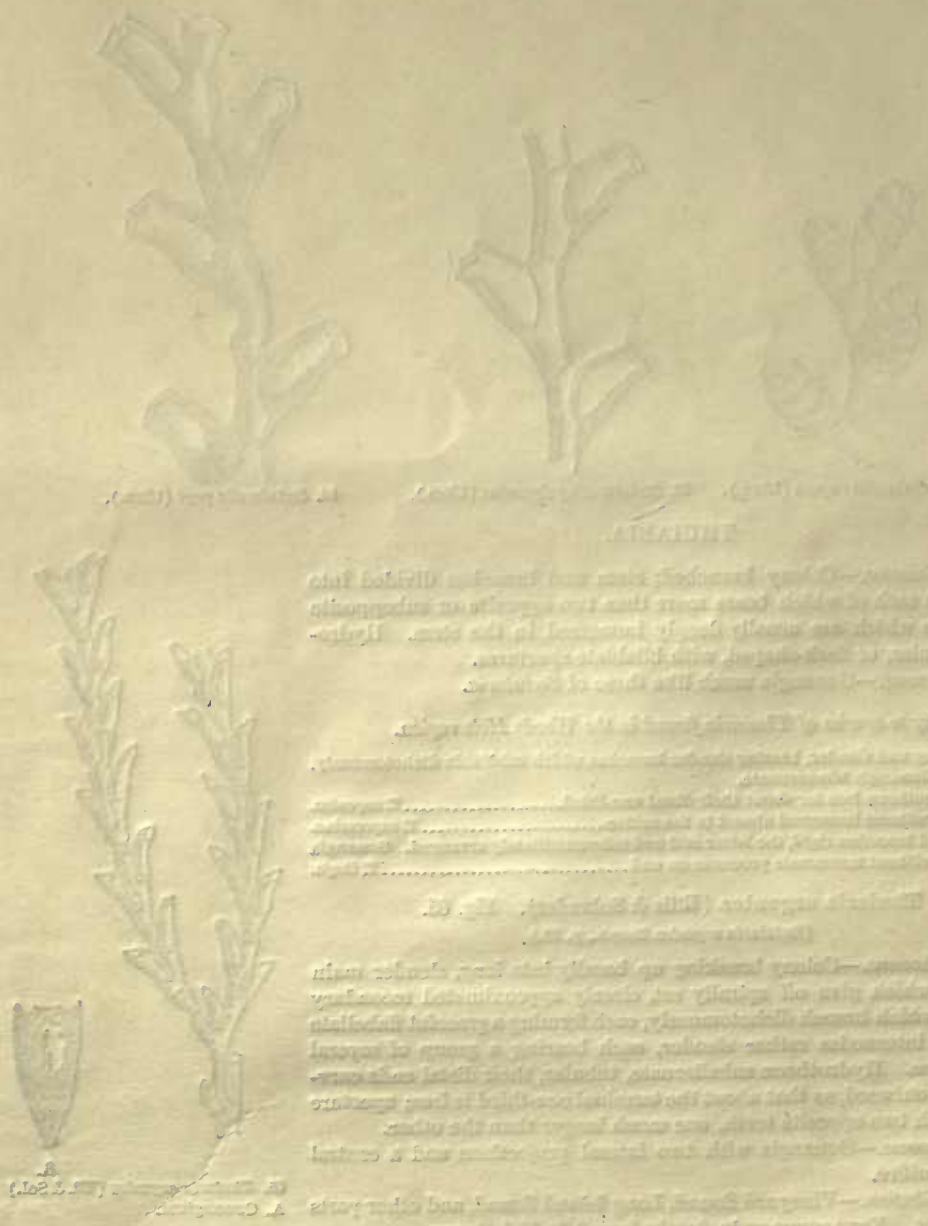
Trophosome.—Colony breaking up basally into long, slender main branches which give off spirally set, closely approximated secondary branches which branch dichotomously, each forming a graceful flabellate structure; internodes rather slender, each bearing a group of several hydrothecæ. Hydrothecæ subalternate, tubular, their distal ends curving gently outward, so that about the terminal one-third is free; aperture armed with two opposite teeth, one much longer than the other.

Gonosome.—Gonangia with two lateral projections and a central terminal orifice.

Distribution.—Vineyard Sound, Long Island Sound, and other parts of the coast. Very common in depths from 1 to 20 fathoms.



65. *Thuiaria argentea* (Ell. & Sol.) A. Gonangium.



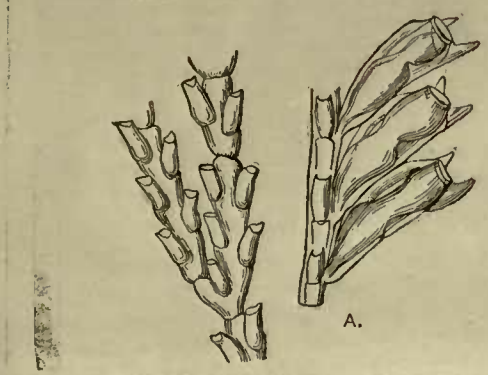
Thuiaria cupressina (Linn.). Fig. 66.

(*Sertularia cupressina* Linn., Syst. Nat., p. 1308.)

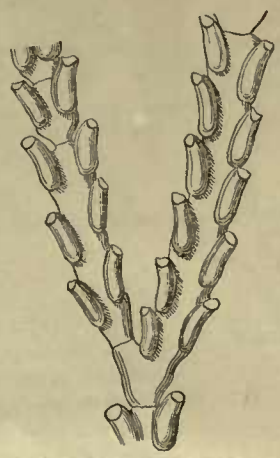
Trophosome.—Colony consisting usually of a single very long and graceful central stem which gives off alternate branches which again divide dichotomously into long alternate branches; giving the appearance of a verticillate arrangement. Internodes much shorter than in the last species, each bearing several pairs of subopposite hydrothecæ. Hydrothecæ immersed nearly to their ends, tubular, rather straight, with a not very pronounced bilabiate aperture.

Gonosome.—Gonangia borne in rows on upper sides of pinnules, shaped like those of *T. argentea*.

Distribution.—Vineyard Sound (Verrill). A specimen in the U. S. Fish Commission collection at Woods Hole is labeled, "E. by S. Sankety Light, 25 fath."



66. *Thuiaria cupressina* (Linn.). A. Gonangia.



67. *Thuiaria thuja* (Linn.).

Thuiaria thuja (Linn.). Fig. 67.

(*Sertularia thuja* Linn., Syst. Nat., p. 1308.)

Trophosome.—Stem rigid, sharply and finally geniculate, without branches on lower portion; branches forming spirals, each dichotomously branched and forming a flabellate structure. All of the branches and branchlets are stiff and harsh, very different from the graceful structures of the preceding species; internodes very thick, each bearing several pairs of closely approximated subopposite hydrothecæ, the top of one often reaching to bottom of one immediately above. Hydrothecæ tubular somewhat swollen below, apertures with two rather inconspicuous opposite teeth of about the same size.

Gonosome.—Gonangia ovate, without lateral spines, and with a short collar and round aperture.

Distribution.—Off Nantucket. (Vinal Edwards).

HYDRALLMANIA.

Trophosome.—Stem branched, the branches plume-like. Hydrothecæ in groups on one side of terminal branches, arranged in an alternate manner, curving to right and left.

Gonosome.—Gonangia ovate, with a terminal aperture surrounded by a slight collar.

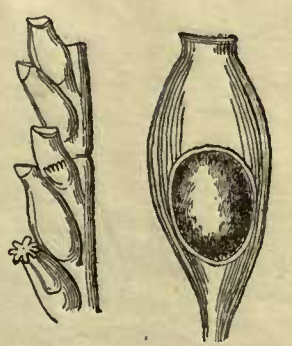
Hydrallmania falcata (Linn.). Fig. 68.

(*Sertularia falcata* Linn., Syst. Nat., p. 1309.)

Trophosome.—Stem slender, without hydrothecæ; branches plume-like, the branchlets divided into internodes, each of which bears a group of several hydrothecæ on its front or upper side. Hydrothecæ flask-shaped, swollen below, narrow above, curved distally and ending in a bidentate aperture with an operculum.

Gonosome.—Gonangia as described above.

Distribution.—Common in rather deep water throughout the Woods Hole region.



68. *Hydrallmania falcata* (Linn.).
A. Portion of branch, side view.
B. Gonangium.





PLUMULARIDÆ.

Trophosome.—Hydrothecæ sessile, usually adnate by one side, arranged on the upper sides of the hydrocladia or hydrotheca-bearing branchlets. Nematophores[1] always present.

Gonosome.—Gonangia often inclosed in protective contrivances, such as modified branches or pod-shaped receptacles called "corbulæ." No medusæ.

Key to genera of Plumularidæ found in the Woods Hole region.

A. Nematophores trumpet-shaped, not immovably fixed to the hydrothecæ.
  a. Branching dichotomous, the hydrocladia springing from the upper side of the branches ..... *Monostæchas.*
  a′. Branching strictly pinnate, the hydrocladia, or some of them, forked ..... *Schizotricha.*
  a″. Branching verticillate or scattered. Cœnosare canaliculated in main stem ..... *Antennularia.*
A′. Nematophores not trumpet-shaped, immovably fixed to hydrothecæ or other parts of colony. Gonangia protected by special, usually forked, branches bearing nematophores without hydrothecæ ..... *Cladocarpus.*

MONOSTÆCHAS.

Trophosome.—Colony dichotomously branched. Hydrocladia borne on upper sides of branches.

Gonosome.—Gonangia ovoid, borne at bases of hydrothecæ.

Monostæchas quadridens (McCr.). Fig. 69.

(*Plumularia quadridens* McCrady, Proc. Elliott Soc., Vol. 1, No. 1, p. 199.)



69. *Monostæchas quadridens* (McCr.).

Trophosome.—Colony erect, composed of a main stem with branches which themselves branch dichotomously, bearing hydrocladia at their points of junction and also on their upper sides; hydrocladia composed of internodes, every alternate one of which bears an hydrotheca. Hydrothecæ cup-shaped, with even margins, adnate for about half their length. Nematophores trumpet-shaped, three associated with each hydrotheca, and usually two on each internode of hydrocladium that does not bear a hydrotheca; a row of nematophores is also found on the upper side of each branch from which hydrocladia spring.

Gonosome.—Gonangia ovoid or pyriform, borne on short pedicels just below the hydrothecæ.

Distribution.—Dredged by the *Albatross* near Marthas Vineyard. Depth, 22 fathoms. The species is common southward to the West Indies in moderate depth.

SCHIZOTRICHA.

Trophosome.—Colony consisting usually of a cluster of simple, upright stems, giving forth hydrocladia in a pinnate manner. Hydrocladia in mature specimens forked.

Gonosome.—Gonangia ovoid, tubular or cornucopia-shaped, borne on the main stem, branches, or hydrocladia.

Key to species of Schizotricha found in the Woods Hole region.

An hydrotheca in the axil of each hydrocladium ..... *S. tenella.*
No hydrothecæ in the axils of the hydrocladia ..... *S. gracillima*

Schizotricha tenella (Verrill). Fig. 70.

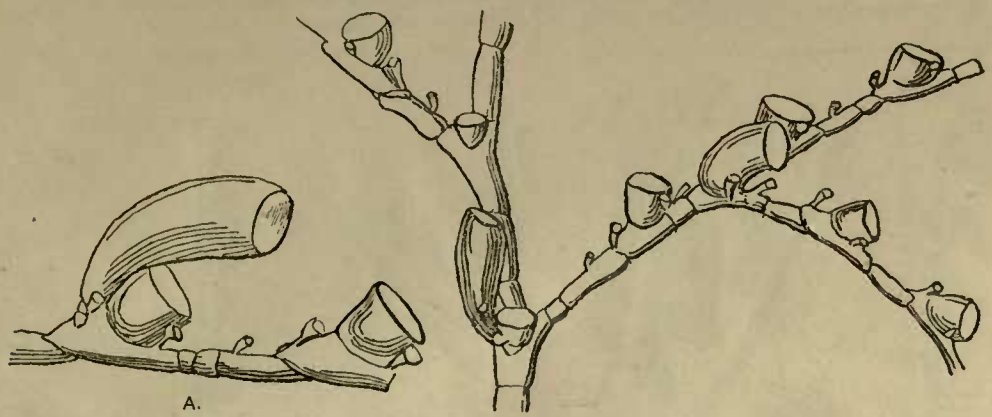
(*Plumularia tenella* Verrill. Invertebrated Animals of Vineyard Sound, p. 731.)

Trophosome.—Colony in the form of very delicate white plumes, 1 to 3 inches high, each plume consisting of a central stem giving off alternate hydrocladia with hydrotheca at base of each; hydrocladia often forked in mature specimens, with internodes and hydrothecæ much as in the last species, but with an additional short internode often intercalated. Nematophores as in the last species, except that there is but one to each intermediate internode.

[1] The nematophores are minute trumpet-shaped or tubular organs composed of chitin and usually associated with the hydrothecæ, two, one on each side, being found near where the margin of the hydrotheca joins the stem to which it is adnate, and one just in front of the bottom of the hydrotheca. Others are found on the branches, stem, and protective contrivances which inclose the gonangia. The nematophores contain highly remarkable structures known as sarcostyles that are capable of enormous extension. They are morphologically "persons" of the colony.

Gonosome.—Gonangia curved, cornucopia-shaped, borne on slender pedicels at the bases of the hydrothecæ and having one or two nematophores on the basal portion.

Distribution.—Found abundantly on the piles of the wharves at Woods Hole and Vineyard Haven. Off Gay Head, 8 to 10 fathoms; Vineyard Sound, 8 fathoms. (Verrill.)



70. *Schizotricha tenella* (Verrill). A. Part of hydrocladium (enlarged).



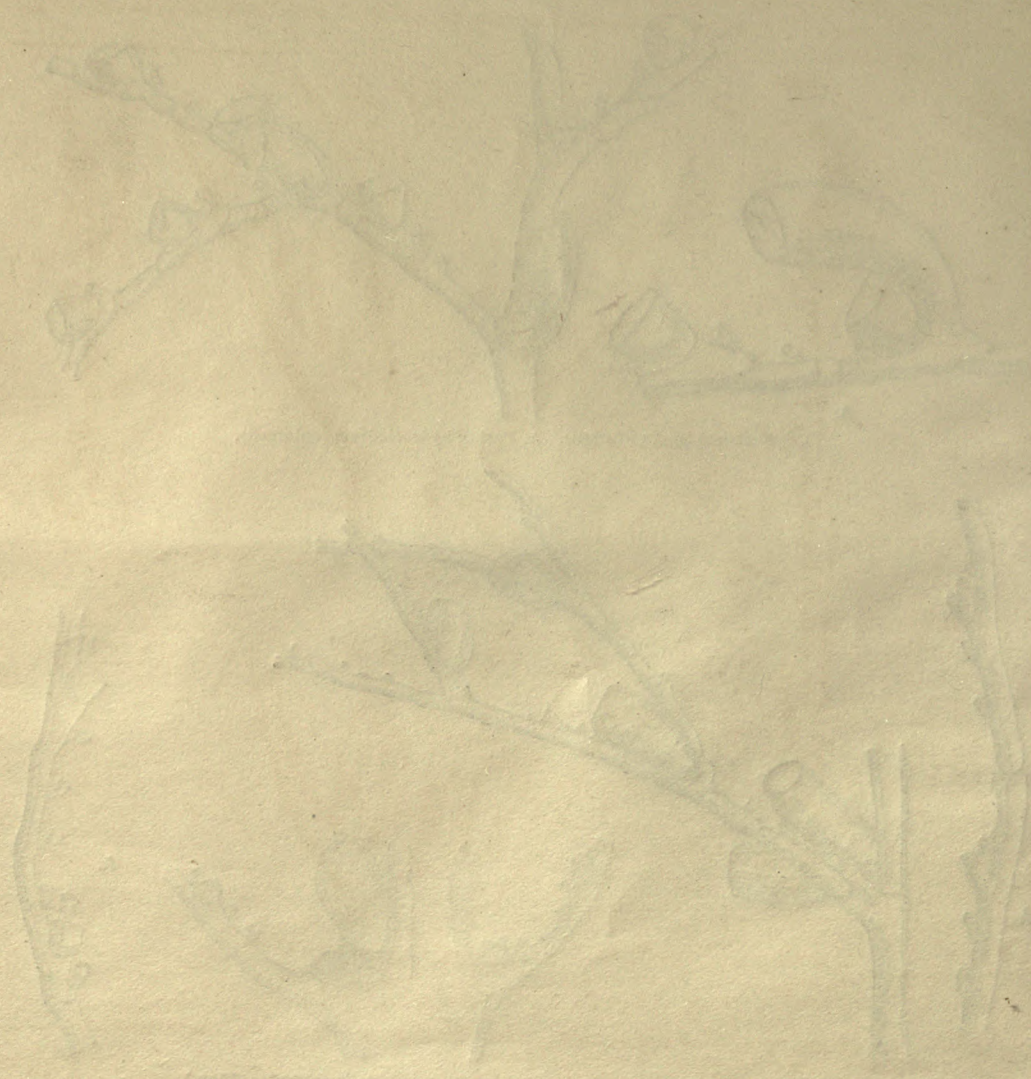
71. *Schizotricha gracillima* (Sars).
A. Part of hydrocladium (enlarged).

72. *Antennularia antennina* (Linn.).
A. Part of hydrocladium (enlarged).

Schizotricha gracillima (Sars). Fig. 71. *Plumularia verrillii* Clark.

(*Plumularia gracillima* Sars. Bidrag til Kundskab om Dyrelivet paa vore Havbanker.)

Trophosome.—Colony consisting of a main stem, which gives off plumose branches near its base. Branches consisting of a slender shaft, giving off alternate rather distant hydrocladia, which are forked and divided into rather distinct internodes which are long and slender and separated by straight nodes. Hydrothecæ small, cup-shaped, almost entirely adnate behind. A pair of trumpet-shaped nematophores are inserted just above the aperture of the hydrotheca, another single one below its base, and others scattered rather irregularly along the hydrocladia and stem.



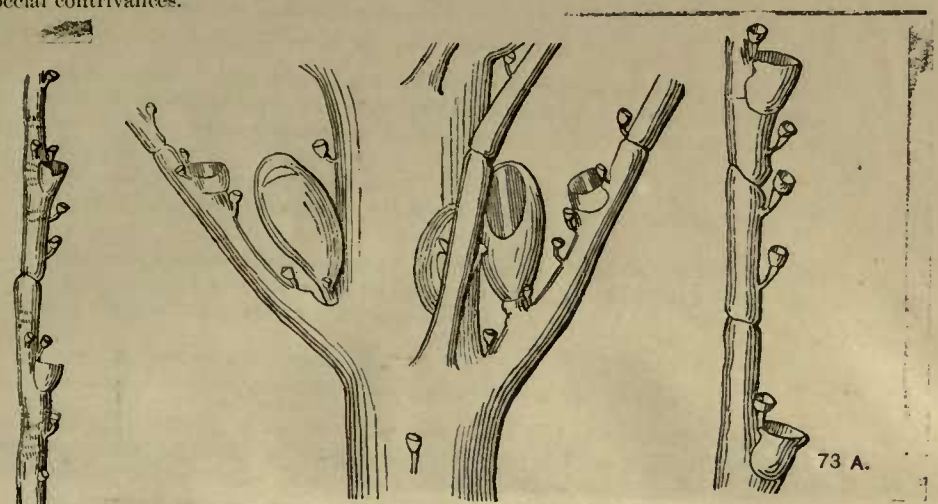
Gonosome.—Gonangia subcylindrical, somewhat swollen below, not curved, borne usually at the origin and forkings of the hydrocladia.

Distribution.—Eastport, Me. (Verrill). It is altogether probable that it occurs in the deeper water in the Woods Hole region. I have included it here to enable collectors to identify it if found.

ANTENNULARIA.

Trophosome.—Hyrocladia arranged in verticels or whorls around stem. Stem with canaliculated cœnosarc, the canals being just under periderm and not well seen except with transmitted light.

Gonosome.—Gonangia borne usually in the axils of the hydrocladia, not protected by gonangia or other special contrivances.



73. *Antennularia americana* Nutting. 73 A. Part of hydrocladium (enlarged).



74. *Antennularia rugosa* Nutting. 74 A. Part of hydrocladium (enlarged).

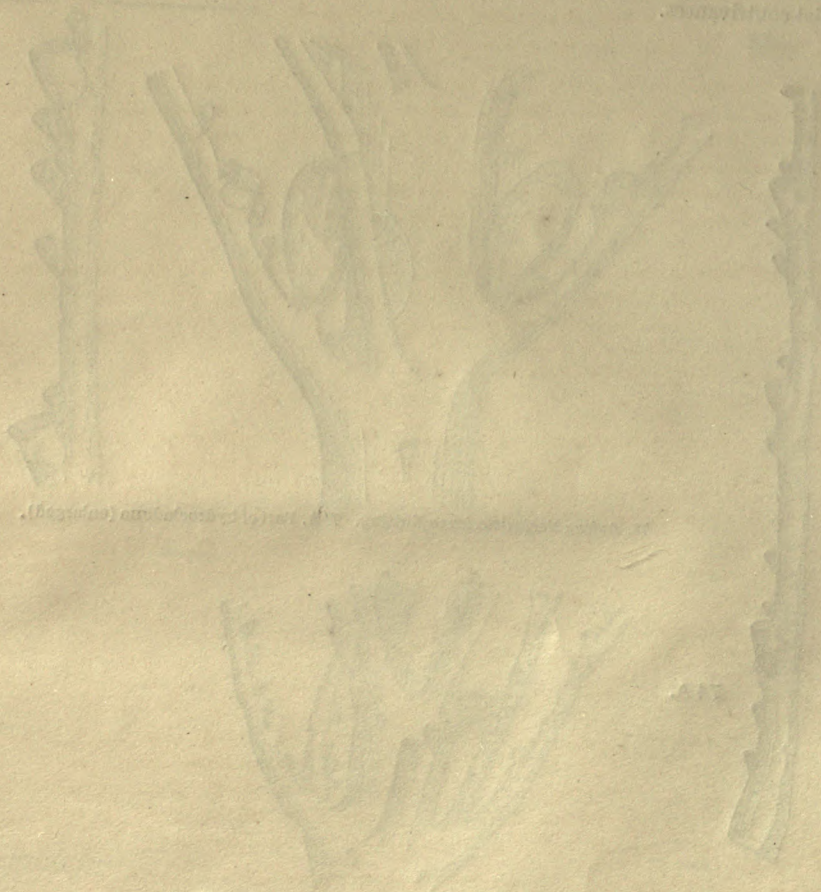
Key to species of Antennularia found in the Woods Hole region.

A. A node between the first hydrotheca on each hydrocladium and the stem from which it springs.....*A. antennina.*
A′. No node between the first hydrotheca and stem.
a. At least two nodes between adjacent hydrothecæ.....*A. americana.*
a′. Hydrocladial nodes distant and usually absent.....*A. rugosa.*

Antennularia antennina (Linn.) Fig. 72.

(*Sertularia antennina* Linn., Syst. Nat., 1310.)

Trophosome.—Colony composed of a cluster of upright stems with whorls of hydrocladia at regular intervals; hydrocladia borne on stout processes from the stem, the first internode being without



hydrotheca, the next with one on its proximal half, and the rest of the hydrocladium being made up of alternating hydrothecate and intermediate internodes. Hydrothecæ cup-shaped, margin entire. Nematophores trumpet-shaped, a pair near the top of each hydrotheca, one below its base in front, two on each intermediate internode, and others on the stem.

Gonosome.—Gonangia borne on bases of hydrocladia, ovoid, deep, with subterminal aperture.

Distribution.—Off Gay Head, 18½ fathoms. Newport Harbor; Woods Hole; off Block Island. (George Gray.)

Antennularia americana Nutting. Fig. 73.

(Monograph of American Hydroids, part 1, The Plumularidæ, p. 69.)

Trophosome.—Colony composed of slender, erect stems bearing hydrocladia usually in whorls of 4. Proximal hydrotheca on each hudrocladium borne on a long process from the stem, there being no node between it and the stem. Otherwise the arrangement of the internodes, hydrothecæ, and nematophores are as in the preceding species.

Gonosome.—Gonangia oblong-ovate, with a subterminal lunate aperture.

Distribution.—Off Marthas Vineyard, *Albatross.* Waters of Rhode Island (specimen from Dr. H. C. Bumpus).

This species, although greatly resembling *A. antennina*, differs constantly in the characters given. In some cases, where a hydrocladium has been broken off and regenerated, there will be a node below the proximal hydrotheca. Otherwise the character is constant.

Antennularia rugosa Nutting. Fig. 74.

(Monograph of American Hydroids, part 1, The Plumularidæ, p. 70.)

Trophosome.—The colony, consisting of upright stems which give off hydrocladia in whorls of 6 or 8, no node between the proximal hydrotheca on each hydrocladium and the stem. Hydrocladia supported by a remarkable thickening of the perisarc on the lower side of the proximal portion of each. Nodes very distant and irregular, but the interiors of the hydrocladia have numerous annular thickenings of the periderm that somewhat resemble nodes. Hydrothecæ deeper than in the other species. A pair of nematophores inserted on a level with top of the hydrotheca, and others scattered along the fronts of the internodes and around the stem.

Gonosome.—Not known.

Distribution.—Off Marthas Vineyard, 46 fathoms. (*Albatross.*)



75. *Cladocarpus flexilis* Verrill.
A. Gonangia with protective branchlets.

CLADOCARPUS.

Trophosome.—Colony branched. Hydrocladia not forked. Nematophores neither movable nor trumpet-shaped.

Gonosome.—Gonangia borne on the stem and protected by special branchlets which spring from near the bases of the hydrocladia, and bear nematophores but no hydrothecæ.

Cladocarpus flexilis Verrill. Fig. 75.

(Report Com. Fish and Fisheries, 1883, p. 517.)

Trophosome.—Stem not fascicled, long and slender; hydrocladia pinnately arranged, alternate, not forked, divided into internodes, each of which bears a hydrotheca, and has its cavity divided by internal ridges. Hydrothecæ deep, subcylindrical, aperture horizontal, with a single strong anterior tooth and a number of shallow lateral teeth or sinuations. Nematophores tubular, a pair slightly overtopping the hydrothecal margin, and a single one below each hydrotheca, its end not rising much above the level of the bottom of the latter.

Gonosome.—Gonangia growing on front of stem, protected by special branches borne on the bases of hydrocladia and branched like deers' horns, each branch bearing a row of nematophores.

Distribution.—Found in moderately deep water at various points along the Atlantic coast.



HYDROID MEDUSÆ FOUND IN THE WOODS HOLE REGION.

A monographic account of the medusæ is in course of preparation by an eminent authority, and the present writer therefore does not desire to discuss the medusæ in a systematic way, but hopes that the key herewith presented will be of service in identifying the medusæ known to occur in the region. No attempt has been made to describe new species or to define families, genera, or other groups. The classification conforms, so far as possible, to the plan of the preceding part of this work when the hydroid form is known. Otherwise the names are the same as those found in Alexander Agassiz's work, North American Acalephæ. Almost all of the illustrations are from specimens taken at Woods Hole and Newport, and sketched by the author.

Key for the identification of the Hydroid medusæ found in the Woods Hole region.

A. Ovaries attached to the proboscis walls and never found along the radial canals. Otocysts never present.
  a. Radial canals 4′, unbranched.
    b. A single conspicuous marginal tentacle. Others, if present, much smaller.
      c. Proboscis not more than one-half length of bell cavity ..... *Euphysa virgulata.*
      c′. Proboscis more than one-half length of bell cavity.
        d. A single greatly enlarged tentacle from which secondary medusæ arise ..... *Hybocodon prolifer.*
        d′. One large and 3 much smaller tentacles. No secondary medusæ ..... *Corymorpha pendula.*
    b′. Two conspicuous marginal tentacles. Others, if present, much smaller.
      c. Bell with a distinct apical projection.
        d. Apical projection a lengthened cone ..... *Stomatocha apicata.*
        d′. Apical projection dome-shaped. Tentacles bearing stalked nematocyst batteries .. *Gemmaria cladophora.*
      c′. Bell evenly rounded, without apical projection.
        d. Tentacles bearing stalked batteries of nematocysts ..... *Corynitis agassizii.*
        d′. Tentacles normal ..... *Perigonimus jonesi.*
    b″. Four tentacles of approximately equal length.
      c′. Proboscis and tentacles very long and slender.
        d. Bell outline subspherical ..... *Coryne mirabilis.*
        d′. Bell outline subconical ..... *Dipurena conica.*
      c′. Proboscis short, not reaching bell opening.
        d. Tentacles tightly coiled. Bell with 8 meridional lines of lasso cells ..... *Ectopleura ochracea.*
        d′. Tentacles rudimentary. No lines of lasso cells ..... *Pennaria tiarella.*
        d″. Tentacles functional. Radial canals very broad ..... *Hydrichthys mirus.*
    b‴. Eight tentacles of approximately equal length.
      c. Tentacles strong, functional. Proboscis bearing secondary medusæ ..... *Dysmorphosa fulgurans.*
      c′. Tentacles rudimentary. No secondary medusæ ..... *Stylactis hooperi.*
    b⁗. Tentacles more than 8, of approximately equal size when full grown, and disposed at regular intervals.
      c. A large globular or subconical process on apex of bell ..... *Turris vesicaria.*
      c′. Bell evenly rounded above ..... *Turritopsis nutricula.*
    b⁗. Tentacles in groups or bunches.
      c. Four clusters of tentacles.
        d. Proboscis small and slender.
          e. A pair of erect clavate tentacles in each group ..... *Nemopsis bachei.*
          e′. Tentacles much alike ..... *Bougainvillia carolinensis.*
        d′. Proboscis large and broad ..... *Bougainvillia superciliaris.*
      c′. Eight clusters of marginal tentacles ..... *Lizzia grata.*
  a′. Radial canals 4, branched at their distal ends ..... *Willia ornata.*
  a″. Radial canals many, bell cup-shaped ..... *Orchistoma tentaculata.*
A′. Ovaries attached to the radial canals, often also to the proboscis. Otocysts usually present.
  a. Radial canals 4.
    b. Marginal tentacles 4, sometimes with lateral cirri.
      c. Proboscis very long, reaching far beyond the velum.
        d. A swelling at base of each tentacle ..... *Eutima mira.*
        d′. No swelling at bases of tentacles ..... *Eutima limpida.*
      c′. Proboscis short. Bell deep.
        d. Tentacles with lateral cirri.
          e. Club-shaped appendages between bases of tentacles ..... *Hebella calcarata* (juv.).
          e′. No club-shaped appendages.
            f. Two otocysts between bases of adjacent tentacles ..... *Eucheilota ventricularis.*
            f′. Three otocysts between bases of adjacent tentacles ..... *Eucheilota duodecemalis.*
        d′. Tentacles without lateral cirri ..... *Clytia bicophora* (juv.).
          Clytia noliformis (juv.).

b'. Marginal tentacles, 16 or more.
c. Proboscis very long, reaching far below velum ..... *Tima formosa.*
c'. Proboscis short.
d. Tentacles with lateral cirri at bases ..... *Hebella calcarata.*
d'. Tentacles without lateral cirri.
e. Bell disk-shaped. Proboscis without fimbriated tentacles.
f. Otoliths on bases of tentacles.
g'. Tentacles 24 at liberation of medusa ..... *Obelia geniculata.*
Obelia longissima.
Obelia flabellata?
g. Tentacles 16 at liberation of medusa ..... *Obelia gelatinosa.*
Obelia dichotoma.
Obelia commissuralis.
e'. Bell deeper, its surface evenly rounded.
f. Otoliths between bases of tentacles.
g. Otoliths 8 (or more?). Mouth tentacles not fimbriated ..... *Clytia bicophora.*
g'. Otoliths 8. Mouth tentacles fimbriated ..... *Tiaropsis diademata.*
g''. Otoliths numerous, with sense-bulbs at their bases ..... *Epenthesces folleata.*
g'''. Otoliths numerous. Tentacles with sense-bulbs and thickened "knee-pads" ..... *Goniomemus vertens.*
e''. Bell with a distinct dome-like apical projection ..... *Oceanea singularis.*
a'. Radial canals 8.
b. Bell very deep, shaped like a bishop's miter ..... *Trachynema digitalis.*
b'. Bell subspherical, somewhat narrowed above. Mouth with fringed tentacles ..... *Melicertum campanula.*
a''. Radial canals more than 8.
b. Manubrium very short, hardly distinguishable ..... *Rhegmatodes tenuis.*
b'. Manubrium well developed.
c. Mouth without fimbriated tentacles. Bell shallow ..... *Equorea albida.*
c'. Mouth with fimbriated tentacles ..... *Zygodactyla groenlandica.*

Euphysa virgulata A. Ag.

(North American Acalephæ, p. 189.)

Bell quadrangular, thick, longer than broad. Proboscis short, tubular, without mouth tentacles. Tentacles 4, of which one is much longer than the others, with a triangular base. Radial canals 4. Velum with a sinuous inner edge.

Coloration.—Tentacles with white bases and a pink stripe or band. Proboscis light yellow.

I have not seen this species, and the above description is condensed from that of Dr. Agassiz.

Hybocodon prolifer L. Ag. Fig. 76.

(Cont. Nat. Hist. U. S., vol. IV, p. 243.)

Bell ovate, evenly rounded, unsymmetrical owing to great development of the single tentacle; its surface marked with 5 meridional orange-colored bands, 2 of which start from the sides of the base of the tentacle. Proboscis long, contractile, sometimes reaching nearly to the velum; no mouth tentacles. A single very large marginal tentacle armed with conspicuous nematocyst batteries and bearing medusæ of a second generation at its base.

Color.—Superficial bands and base of tentacle orange red.

Distribution.—Taken in the tow at Woods Hole (Vinal Edwards.) The colored bands are not easily seen in these specimens, which were collected in April.

This species can at once be recognized by its single greatly developed tentacle with secondary medusæ at its base.

Corymorpha pendula L. Ag.

(Cont. Nat. Hist. U. S., p. 276. The medusa is described by A. Agassiz in North American Acalephæ, p. 192.)

Bell deep, with the apex somewhat pointed, slightly unsymmetrical owing to the excessive development of one tentacle. Proboscis long, often reaching below the velum. Tentacles 4, one being much the largest, but not bearing secondary medusæ at its base.

Color.—Proboscis light yellow; bases of tentacles light pink. (A. Agassiz.)

Distribution.—I find no record of this medusa having been found in the Woods Hole region, although the hydroid form from which it grows has been found there. Alexander Agassiz reports it from off Cape Cod.

Stomatocha apicata (McCrady). Fig. 77.

(*Saphenia apicata* McCr. Proc. Elliott Soc., vol. 1, No. 1, p. 130.)

Male.—Bell broad and shallow, with a long conical projection at its summit. Marginal tentacles 2, very long, but capable of retracting into short, finger-like bodies as in the figure; rudiments of other tentacles around the margin. Proboscis very large and bulky, composed of lobes that extend to the 4 mouth tentacles, which are pointed and reach below the velum. Radial canals 4.

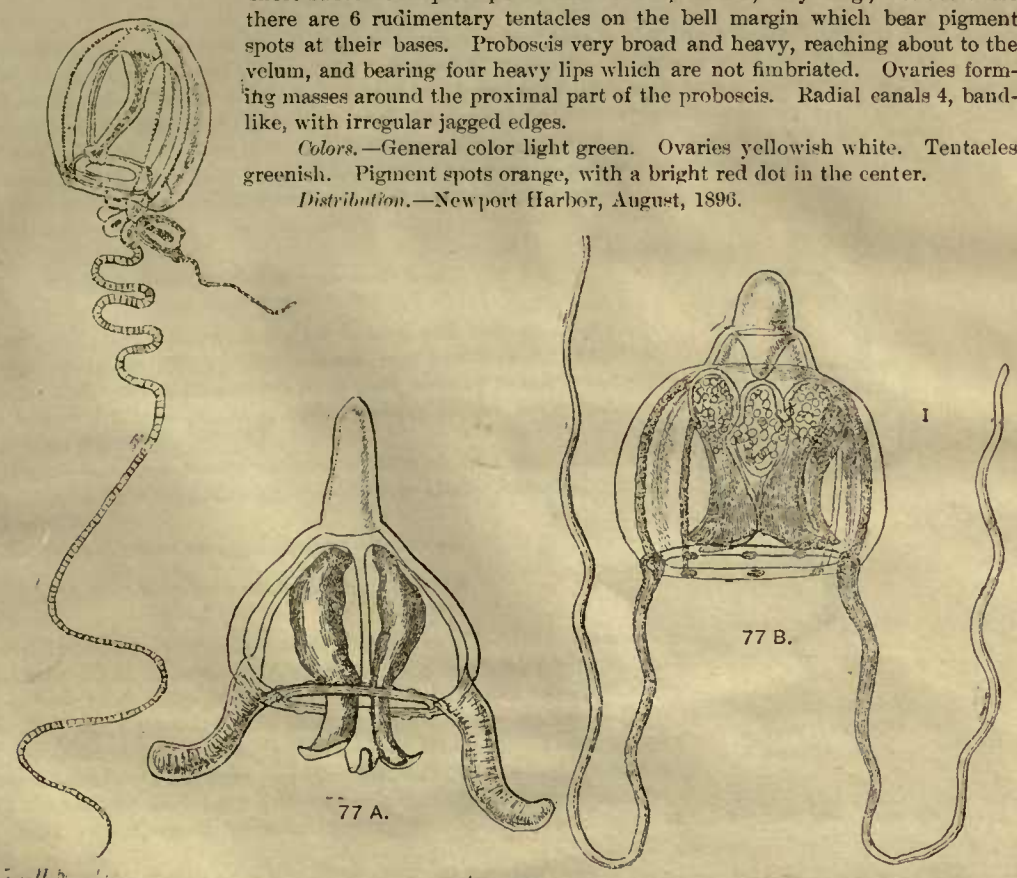
Colors.—Tentacles rich purple, tipped with olive green. Spermaries and basal part of proboscis clear light emerald green. These colors differ greatly from those given by McCrady. They are taken by myself from a living specimen.

Dinamatella cavosa Fewkes.

Female.—Bell subglobular with a cone-shaped apical projection, the cone being shorter than in the male, and divided into two portions, a basal dome-shaped portion being surmounted by the short subconical apical part. Tentacles 2, hollow, very long; besides these there are 6 rudimentary tentacles on the bell margin which bear pigment spots at their bases. Proboscis very broad and heavy, reaching about to the velum, and bearing four heavy lips which are not fimbriated. Ovaries forming masses around the proximal part of the proboscis. Radial canals 4, band-like, with irregular jagged edges.

Colors.—General color light green. Ovaries yellowish white. Tentacles greenish. Pigment spots orange, with a bright red dot in the center.

Distribution.—Newport Harbor, August, 1896.

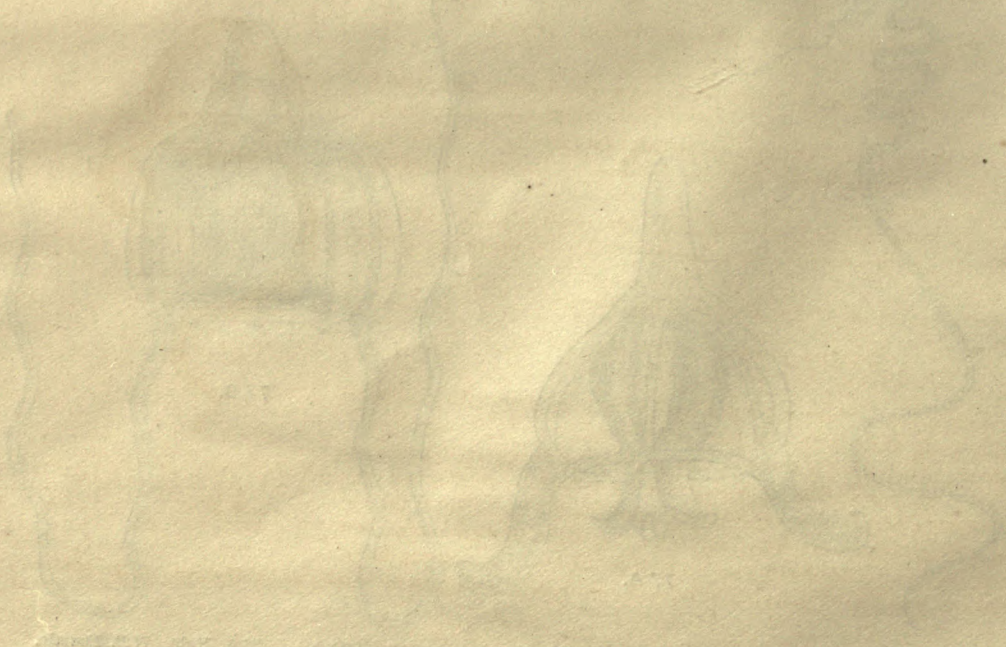


76. *Hybocodon prolifer* Ag. 77. *Stomatocha apicata* (McCr.). 77 A. Male. 77 B. Female.

Gemmaria cladophora A. Ag. Fig. 79.

(North American Acalephæ, p. 184.)

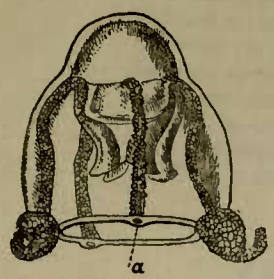
Bell rather deep, the apical portion being elevated into a shallow rounded dome not sharply, but still evidently differentiated from the rest of the bell. Tentacles 4, two of which are much the longest and bear curious clusters of nematocysts borne on short stalks or pedicels. Proboscis scarcely reach-



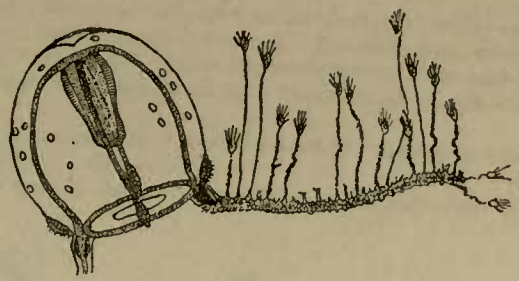
ing the bell opening, constricted just above the 4 small lips or mouth-arms, and bearing the ovaries on the proximal portion. Radial canals broad.

Colors.—The large tentacles light brown with a slight orange tinge at bases. There are bright yellow pigment spots at the bases of the two rudimentary tentacles.

Distribution.—Collected at Woods Hole, August, 1899.



79. *Gemmaria cladophora* A. Ag.



80. *Corynitis agassizii* (McCr.). (After Murbach.)

Corynitis agassizii (McCrady). Fig. 80.

(Proc. Elliott Soc., vol. I, No. 1, p. 132.)

Bell deep, orbicular, without apical prominence. Tentacles 2, very long, bearing stalked batteries of nematocysts. There are also two rudimentary tentacles. Proboscis short and simple, without expanded lips. Radial canals 4, not broad and bandlike, and with curious bulging groups of nematocysts on the outside of the bell over the distal portions of the canals.

Colors.—Not given either in the original description or that of Dr. L. Murbach, who first established the connection between *Corynitis agassizii* and *Gemmaria gemmosa* of McCrady, the latter being the medusa of the former. His figures are here copied by permission.

Distribution.—Woods Hole. (L. Murbach.)

Perigonimus jonesii Osborn & Hargitt. Fig. 81.

(American Naturalist, 1894, p. 27.)

Bell orbicular, marginal tentacles 2, long and hollow, alternately with two eye-spots, which may indicate two rudimentary tentacles. Proboscis short, not reaching much more than halfway to the broad and strong velum. Radial canals 4, those leading to the large tentacles broader than the others.

Colors.—Not given by the describers. The medusa buds, while still attached, are a light salmon color in specimens kindly furnished me by Dr. Hargitt.

Distribution.—Cold Spring Harbor, Long Island.



81. *Perigonimus jonesii* Osb. & Harg. (After Osborn & Hargitt.)

Coryne mirabilis Ag. Fig. 82.

(Cont. Nat. Hist. U. S., vol. IV, p. 185.)

Bell orbicular. Marginal tentacles 4, very long, each with a swollen pigmented body at its base. Proboscis very long, reaching far below the bell opening when fully extended, but capable of being retracted well within the bell, suspended from the bell by a narrow, contracted portion. Mouth a simple opening without mouth tentacles. The attached medusa is longer, the tentacles closely coiled, and the proboscis retracted within the bell and often having its walls distended with sexual products.

Colors.—Specimens in formalin have the proboscis and tentacle bulbs light yellowish. Eye-spots black.

Distribution.—Collected at Woods Hole by Mr. George Gray.







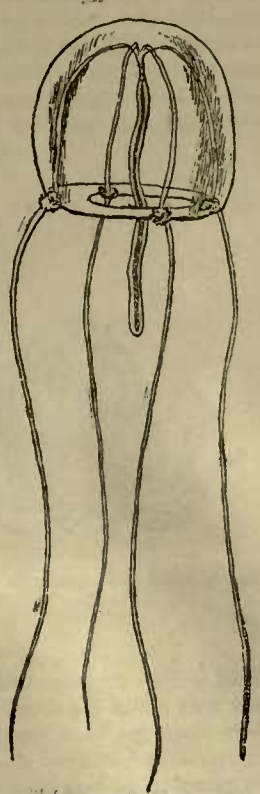
Dipurena conica A. Ag.
(North American Acalephæ, p. 181.)

Bell a rounded cone. Marginal tentacles 4, rather short, each with a rounded knob on the distal end and a pigmented spot and eye-speck at the base. Proboscis long, when fully extended reaching far below the rather broad velum, but capable of great retraction; attenuated proximally and swollen distally; mouth plain, without mouth tentacles. Radial canals 4, slender. Young specimens are almost globular in form.

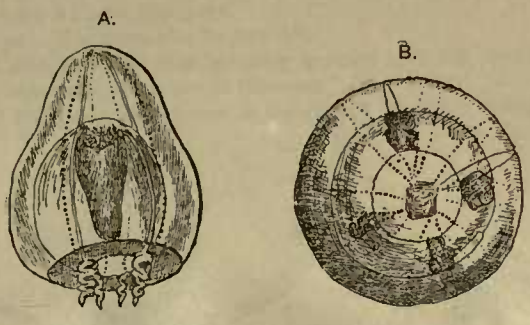
Colors.—Distal and proximal ends of tentacles reddish. Eye-specks black.

Distribution.—Naushon (A. Agassiz).

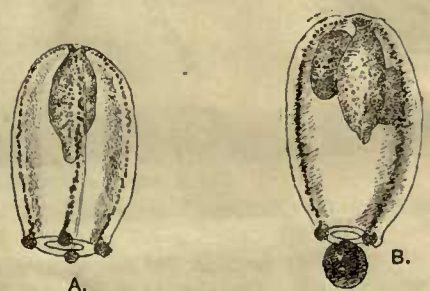
I have not seen this species; the above description is condensed from that of Dr. A. Agassiz.



82. *Coryne mirabilis* (Ag.)



83. *Ectopleura ochracea* A. Ag.
A. Lateral view. B. Aboral view.



81. *Pennaria tiarella* McCr.
A. Medusa from which the ova has been expelled.
B. Medusa expelling an ovum.

Ectopleura ochracea A. Ag. Fig. 83.
(In L. Agassiz Cont. Nat. Hist. U. S., vol. IV, p. 343.)

Bell longer than broad, subpyriform in shape, the upper end being the smaller; surface ornamented by eight meridional bands of nematocysts, a band originating on each side of each tentacle base and passing directly over the surface of the bell to its apex. Tentacles 4, short, usually carried so closely coiled as to appear like mere knobs. Proboscis terete, not reaching to the bell opening, and ending in a simple mouth. Radial canals 4.

Colors.—Manubrium bright yellow proximally and distally, the middle part being rose pink. Tentacular bulbs ochraceous, with a red eye-spot on each.

Distribution.—Abundant at Newport in August. Woods Hole. Probably common throughout the region discussed in this work.



Tetraplatia volitans, A. Agass. Fig. 83.
(In L. Agassiz Cont. Nat. Hist. U. S., vol. iv, p. 383.)

Pennaria tiarella McCr. Fig. 84.
(Proc. Elliott Sc., vol. 1, No. 1, p. 153.)

Bell very deep, regularly elliptical in outline. Marginal tentacles 4, rudimentary. Proboscis oblong ovoid, with both ends constricted, not reaching velum; mouth opening not apparent. Radial canals 4, accompanied with lines of dark pigment.

Colors.—Manubrium and lines over radial canals deep pink, the latter being darker and more brilliant.

Distribution.—Common in shallow water throughout the Woods Hole region, especially in the latter part of the summer. Growing profusely on the piles of the wharf at Woods Hole and on the eelgrass nearby.

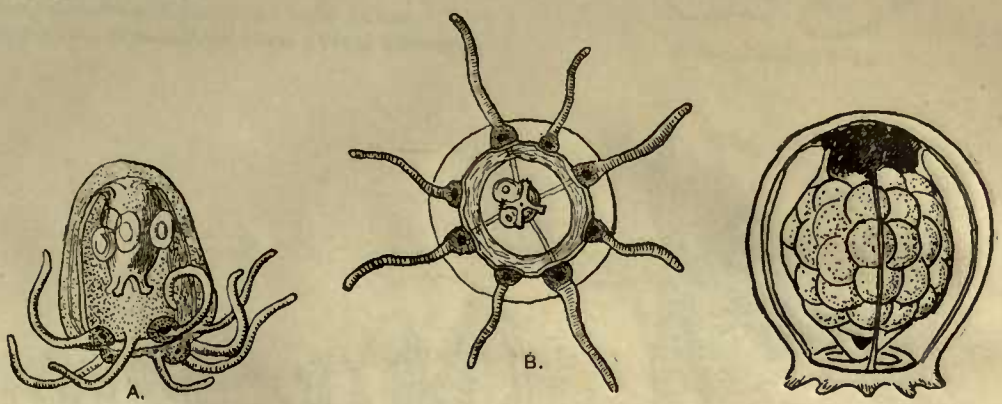
Hydrichthys mirus Fewkes.
(Bull. Mus. Comp. Zool., vol. XIII, No. 7, p. 224.)

Bell oval, nearly spherical, its surface dotted with nematocysts. Marginal tentacles 2, when first liberated, afterwards 4. Radial canals 4, very broad, bandlike. Proboscis cylindrical, not reaching the broad velum. The tentacular bulbs are without eye-spots.

Colors.—Proboscis orange and yellow. Tentacular bulbs reddish.

Distribution.—The type specimens were liberated from a colony growing on a fish, *Seriola zonata*, which was brought into Dr. Alexander Agassiz's laboratory at Newport.

I have not seen this species, and the above description is condensed from that of the original describer.



85. *Dysmorphosa fulgurans* A. Ag. A. Lateral view. B. Ventral view.

86. *Stylactis hooperi* Sigerfoos (after Sigerfoos).

Dysmorphosa fulgurans A. Ag. Fig. 85.
(North American Acalephæ, p. 163.)

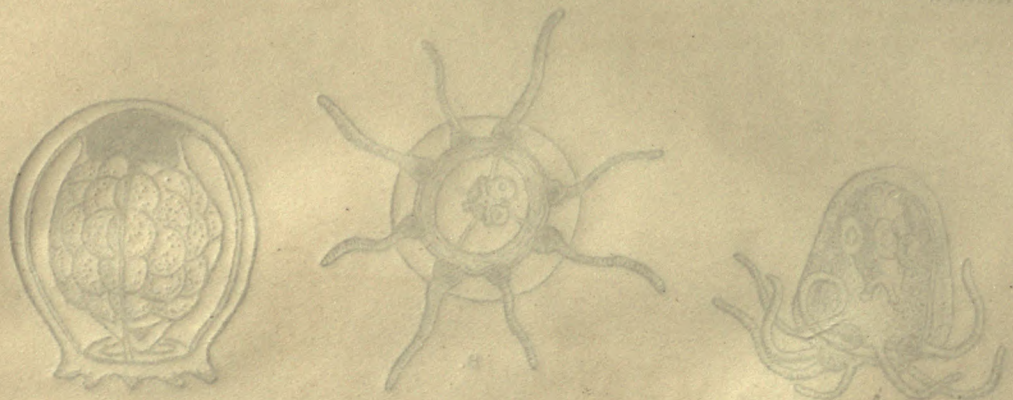
Bell ovoid, its surface having a granulated appearance. Marginal tentacles 8, rather stout, and held somewhat stiffly, each with a bulbous expansion with a distinct eye-spot at its base. Proboscis short, not reaching much more than halfway to the bell opening, and ending with four mouth tentacles furnished with terminal rounded batteries of nematocysts. Specimens secured in August had young medusæ growing on the upper part of the proboscis, and these themselves often show budding medusæ of still another generation. Radial canals 4.

Colors.—The pigment spots at the bases of the tentacles are bright orange red.

Distribution.—During the summer, throughout the Woods Hole region. Agassiz says in reference to this species that it is "sometimes so abundant that the whole sea, when disturbed, is brilliantly lighted by the peculiar bluish phosphorescent color which they give out."

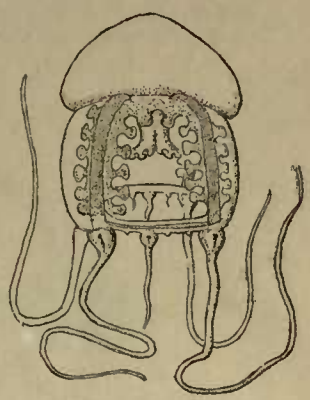
Stylactis hooperii Sigerfoos. Fig. 86.
(American Naturalist, vol. XXXIII, No. 394, p. 801.)

Bell ovoid. Marginal tentacles 8, rudimentary. Proboscis very large and broad, not reaching beyond the bell opening, greatly distended with sexual products at time of liberation, without mouth tentacles or mouth. Eye-spots absent. Radial canals 4.



Colors.—Not given by the original describer. The color of the medusæ while still attached in specimens preserved in formalin is light salmon.

Found growing on a live gasteropod, *Ilyanassa*. Collected near Woods Hole by Mr. Waldron. Type from Cold Spring Harbor, L. I.



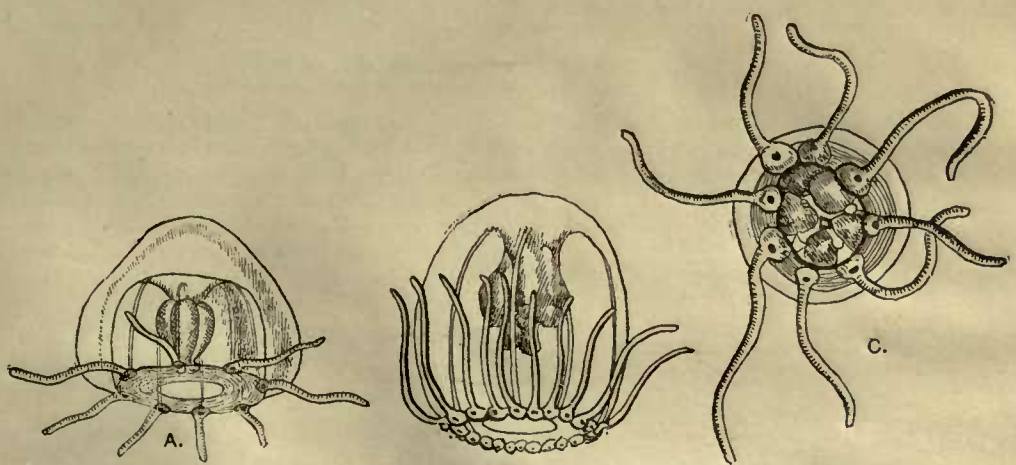
87. *Turris vesicaria* A. Ag.

Turris vesicaria A. Ag. Fig. 87.
(North American Acalephæ, p. 164.)

Bell dome-shaped, surmounted by a subglobular or subconical body, which appears to be hollow. Tentacles numerous when full grown, but one good-sized specimen, apparently almost mature, has only 8. Each tentacle is dilated at the base into a tentacular bulb that bears an eye-spot. Proboscis short, ending in four frilled mouth arms. Ovaries, forming large complicated frills, extending down on either side of the radial canals and connecting at their proximal ends. Radial canals 4, broad and with transverse striæ and edges which appear jagged or frayed out.

Colors.—Ovaries and tentacular bulbs yellow.

Distribution.—Woods Hole, Mass. (Vinal Edwards).



88 *Turritopsis nutricula* McCr.
A. Lateral view of young. B. Lateral view of older specimen. C. Ventral view of young.

Turritopsis nutricula McCrady. Fig. 88.
(Proc. Elliott. Soc. vol. I, No. 1, p. 127.)

Bell hemispherical ovoid, or sub-conical. Marginal tentacles varying in number according to age, from 4 to 24 in specimens examined, and held somewhat stiffly, each with a tentacular bulb bearing an eye-spot at its base. Proboscis not reaching to the bell opening, and ending in four small mouth tentacles bearing distal clusters of nematocysts. The genital products are contained in four large oval masses around the proximal part of the proboscis and reaching to the bases of the mouth-arms. Radial canals 4. Velum broad.

Colors.—Eye-spots red. Distal part of ovaries bright lemon yellow.

Distribution.—Naushon. (A. Agassiz.) Woods Hole, Massachusetts.



Fig. 82.



A.

B.

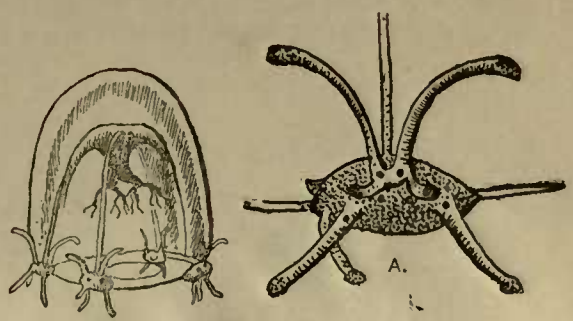
C.

Nemopsis bachei Ag. Fig. 89.
(Mém. Am. Acad. Sci., IV, p. 289.)

Bell deep, ovoid, sometimes almost globular; thickness of bell substance greater than in most of preceding species, making bell cavity proportionally small. Tentacles in 4 bunches, the middle pair in each bunch being distinctly club-shaped at ends. Proboscis short and small, ending in 4 much-branched mouth-tentacles, each ramification of which ends in an oval group of nematocysts. Mouth-tentacles highly retractile and not evident when animal is disturbed. The bunches of marginal tentacles are borne on conspicuous swellings or pads at terminations of the four radial canals, and each tentacle has a black eye-spot above its base.

Colors.—Tentacular bulbs and ovaries yellow. Ends of middle tentacles of each bunch dark brown.

Distribution.—Nantucket and Naushon (A. Agassiz), Newport, Vineyard Sound, Buzzards Bay.



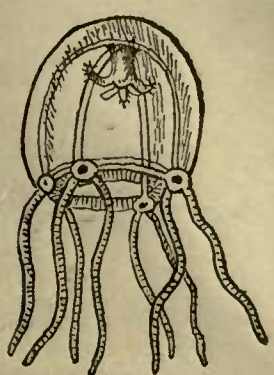
89. *Nemopsis bachei* L. Ag. (juv.)
A. A sense-bulb and group of tentacles (enlarged).

Bougainvillia carolinensis (McCr.). Fig. 90.
(*Hippocrene carolinensis* McCr. Proc. Elliott Soc., vol. I, No. 1, p. 164.)

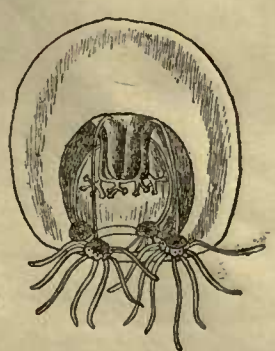
Bell subglobular, thick. Marginal tentacles in four bunches, arising from marginal swellings which are narrower and more pointed than in the preceding species. Tentacles all alike, with slightly enlarged ends, and eye-spots over their bases. Proboscis slender, with four branched mouth-tentacles ending in nematocyst batteries. Radial canals, 4.

Colors.—Tentacular bulbs red, edged with yellow. Proboscis red.

Distribution.—Common in the Woods Hole region.



90. *Bougainvillia carolinensis* (McCr.). (juv.).



91. *Bougainvillia superciliaris* Ag.



92. *Lizzia grata* A. Ag.

Bougainvillia superciliaris Ag. Fig. 91.
(Cont. Nat. Hist. U. S., vol. IV, p. 289.)

Bell sub-globular, very thick. Marginal tentacles in four pairs at birth, later in four bunches. Tentacular bulbs and eye-spots as in the preceding species. Proboscis thick and heavy but not reaching much more than half way to the bell opening, ending in four branched mouth-tentacles terminating in nematocyst batteries. Radial canals, 4.

Colors.—Marginal sense—bodies orange red surrounded by yellow. Proboscis pale yellow, tinged with red distally.

Distribution.—Newport, Rhode Island (Leidy). Woods Hole.





Lizzia grata A. Ag. Fig. 92.

(Proc. Boston Soc. Nat. Hist., p. 100.)

Bell deep, sub-conical in outline, lower portion noticeably wider than upper. Marginal tentacles in 8 clusters borne on marginal swellings, but without distinct eye-spots at base of each tentacle. Proboscis rather large, capable of being protruded nearly to bell opening, and ending in 4 mouth-tentacles which are branched, but not so extensively as in preceding species. Radial canals, 4.

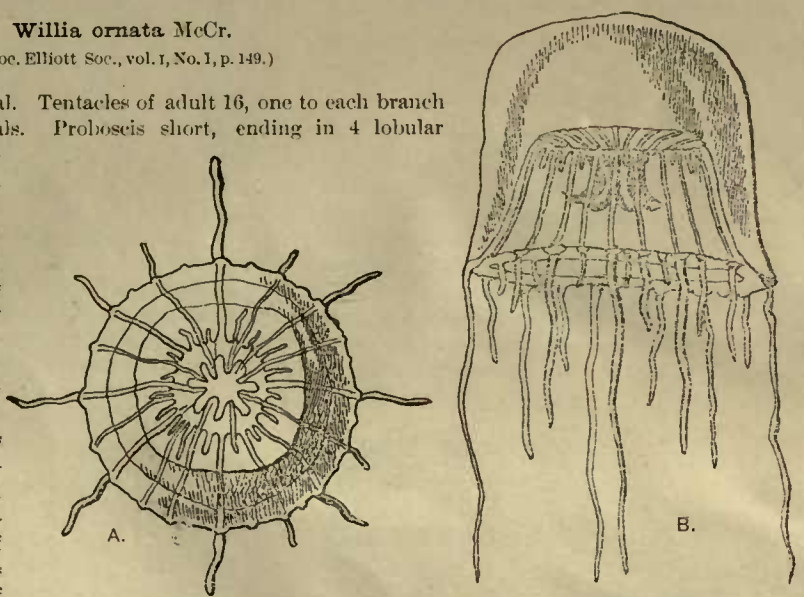
Colors.—Marginal swellings deep orange brown.

Distribution.—Newport, Rhode Island.

Willia ornata McCr.

(Proc. Elliott Soc., vol. I, No. 1, p. 149.)

Bell sub-conical. Tentacles of adult 16, one to each branch of the radial canals. Proboscis short, ending in 4 lobular unbranched mouth-tentacles armed with nematocysts which are not aggregated into round batteries. Ovaries forming 4 masses around proximal part of proboscis. Radial canals 4, each divided distally into 4 branches. Between each pair of tentacles a superficial structure like a "knotted chord" passes upward on outside of bell. Sense-bulbs found at bases of tentacles.



106. *Orchistoma tentaculata* Mayer. A. Aboral view. B. Lateral view.

Colors.—Not described by McCrady or Agassiz.

Distribution.—Buzzards Bay, Naushon. (A. Ag.)

I have not seen this species, and the above description is condensed from that of McCrady.

Orchistoma tentaculata Mayer.

(Bull. Mus. Comp. Zool., vol. XXXVII, No. 1, p. 3.)

Bell deep, cup-shaped, its substance very thick in upper portion much reducing depth of bell cavity. Marginal tentacles 32, with sense-bulbs at their bases. No otocysts. Proboscis short, with 4 lobulated mouth-arms, the lobes margined with nematocyst bearing tentacles. Radial canals 16, alternating with 16 short tubes given off from near top of bell cavity. Ovaries borne on proboscis.

Colors.—Proboscis and sense-bulbs red.

Distribution.—Newport, Rhode Island.

Eutima limpida A. Ag.

(North American Acalephæ, p. 116.)

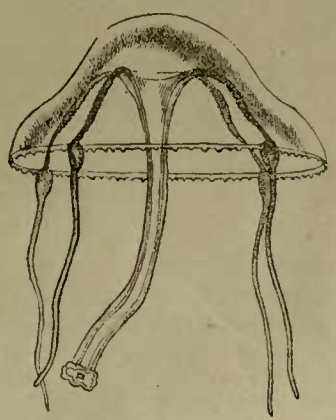
Like *E. mira* with the following exceptions: Bases of the four tentacles not swollen, and each provided with two lateral cirri. The ovaries, tentacles, and proboscis almost colorless.

Distribution.—Buzzards Bay; Naushon. (A. Ag.)

Eutima mira McCr. Fig. 93.

(Proc. Elliott Soc., vol. I, No. 1, p. 190.)

Bell broad, sub-conical, the lateral profile sinuous, upper part dome-shaped. Tentacles 4, with swollen sense-bodies at bases, but without lateral cirri. Otocysts 8, two between each two radial canals, conspicuous, containing highly refractile granules. A number of rudimentary tentacles around the bell margin. Proboscis very long, extending below the bell two or three times the depth of the latter, and ending in a mouth surrounded by a disk-like lobed frill. Ovaries disposed along the radial canals.



93. *Eutima mira* McCr.

Colors.—Swollen tentacular bases a bright light green. Ovaries whitish. Proboscis not noticeably colored.

Distribution.—Woods Hole, Massachusetts. August 10, 1899.

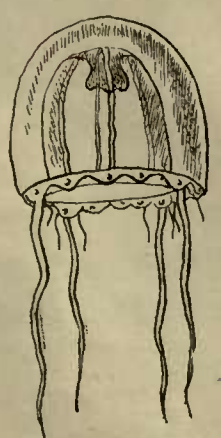
Hebella calcarata (A. Ag.)=*Dynamena cornicina* McCr. (in part). Fig. 94.

(*Laodicea calcarata* Ag., Cont. Nat. Hist. U. S., p. 350.)

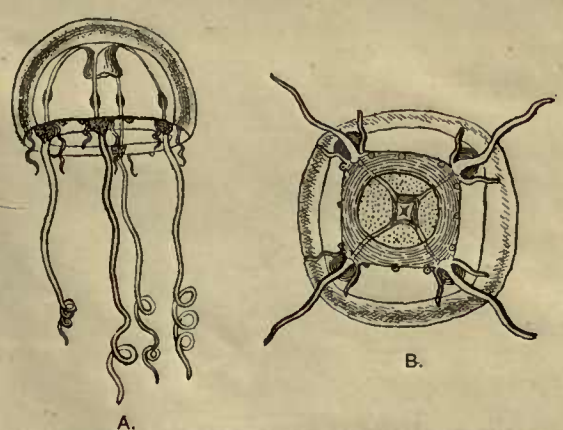
Bell of adult rather shallow, bowl-shaped, young almost spherical, with the outline of the sides rather sinuous. Marginal tentacles rather numerous, hollow, with sense-bulbs at their bases, and a spur-like projection extending inward from the base of each. Other tentacles have no sense-bulbs and are much more slender, appearing like lateral cirri in young specimens; still other tentacles are short and clavate. Proboscis very short, ending in four frilled mouth-arms. Ovaries in form of convoluted bands along the four radial canals.

Colors.—Ovaries and larger tentacles dark yellowish. Eye-spots dark violet. (A. Ag.)

Distribution.—Vineyard Sound (Verrill); Newport and Woods Hole. Naushon. (A. Ag.)



94. *Hebella calcarata* (Ag.).



A. B.

95. *Eucheilota duodecemalis* A. Ag. A. Lateral view. B. Oral view.

Eucheilota ventricularis McCr.

(Proc. Elliott Soc., vol. I, No. 1, p. 187.)

Bell hemispherical. Tentacles 16 to 20, with sense-bulbs at bases, highly contractile. Otocysts 8, with refractile granules arranged in an arc. Proboscis short, tubular, not reaching to bell opening. Radial canals 4, wide. Ovaries occupying whole length of radial tubes. Velum wide.

Colors.—Proboscis yellow, with a red central portion. Ovaries yellow, sense-bulbs with a red center.

Distribution.—Naushon; Buzzards Bay (A. Ag.).



The above description is condensed from that of McCrady. Dr. Agassiz appears to doubt whether his species is the same as that of McCrady, and describes it as having lateral cirri to the tentacles. I have not seen this species.

Eucheilota duodecemalis A. Ag. Fig. 95.

(Cont. Nat. Hist. U. S., IV, p. 353.)

Bell hemispherical or sub-globular. Marginal tentacles 4, each with a sense-bulb and two lateral cirri at its base. Three otoliths between each two tentacles, making twelve in all. Proboscis very short, tubular, with inconspicuous lips. Ovaries along radial canals, very conspicuous when mature. Radial canals 4. Velum broad.

Colors.—Spots on sense-bulbs straw-yellow.

Distribution.—Buzzards Bay (A. Ag.); Newport; Woods Hole.

Clytia noliformis (McCr.).

(*Campanularia noliformis* McCr., Proc. Elliott Soc., vol. I, No. 1, p. 194.)

Bell hemispherical. Marginal tentacles 4 in young, and more numerous in adults. Otocysts 8, two between each two radial canals; always between tentacle bases, and not on them. No eye-spots. Proboscis very short, ending in a four-lobed mouth. Radial canals 4.

Colors.—There are no conspicuous colors. Ovaries yellowish-white.

Distribution.—Buzzards Bay and Naushon (A. Agassiz, under name of *Platypyxis cylindrica*).

Clytia bicophora Ag.

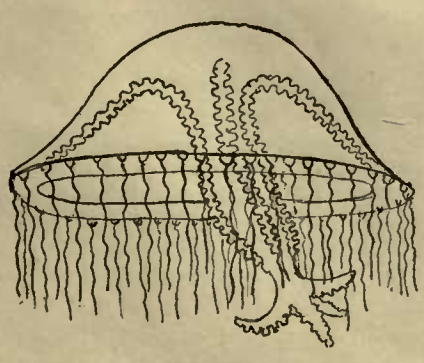
(Cont. Nat. Hist. U. S., vol. IV, p. 304.)

Bell hemispherical, considerably flattened in older specimens. Tentacles 4 to 16, according to age. Otoliths 8 or 16, according to age, placed between tentacular bases. Proboscis short, ending in a 4-lobed mouth. Ovaries, in adult, reaching along radial canals nearly to proboscis. Radial canals 4.

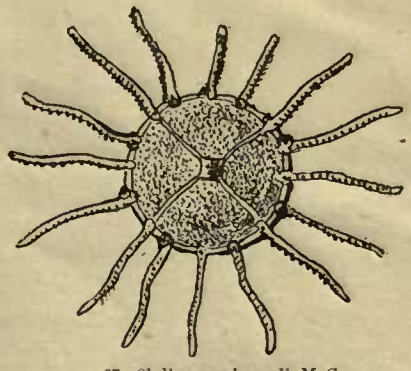
Colors.—Ovaries brown. Black spots on swollen bases of tentacles.

Distribution.—Naushon; Vineyard Sound (A. Ag.).

I have not seen this species, and the above description is condensed from that given by Dr. A. Agassiz, North American Acalephæ, p. 78.



96. *Tima formosa* Ag.



97. *Obelia commissuralis* McCr.

Tima formosa Ag. Fig. 96.

(Cont. Nat. Hist. U. S., vol. IV, p. 362.)

Bell broadly campanulate, the edges perceptibly flaring, the lateral outline sinuous. Marginal tentacles 32, some of which are often rudimentary, with swollen sense-bulbs at their bases. Otocysts numerous, placed between the bases of the tentacles, each with a few granules near its margin. Proboscis very long, in the shape of a very attenuate cone with its base upward, and extending far beyond the bell opening when expanded. Mouth surrounded by four conspicuous frilled lappets. Ovaries strongly convoluted and extending the full length of radial canals and proboscis. Radial canals 4. Size very large. Among the largest of our hydroid medusæ.

Colors.—Ovaries and sense-bulbs whitish; sometimes light-yellowish.

Distribution.—Woods Hole (F. M. Walmsley); Vineyard Sound (Verrill).



Obelia commissuralis McCr. Fig. 97.

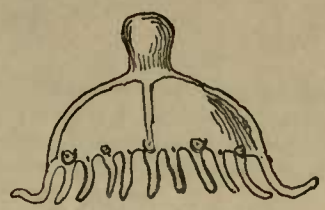
(Proc. Elliott Soc., vol. 1, No. 1, p. 197.)

Bell disk-shaped. Marginal tentacles 16 at time of liberation, long and slender. Ovaries not developed at time of liberation.

Distribution.—Colonies abundant in Woods Hole region, growing on piling of wharves and on submerged timbers generally.

Obelia geniculata (Linn.). Figs. 39A, 98.

(*Sertularia geniculata* Linn., Syst. Nat., p. 1312.)



98. *Obelia geniculata* (Linn.).

Bell disk-shaped, or shallow bowl-shaped. Marginal tentacles 24 at birth, each with an inward projecting spur. Otoliths 8, two between each two radial canals, placed over the bases of the tentacles and not between them. Proboscis short, with four inconspicuous lobular lips. Radial canals 4. Ovaries oval, hanging beneath the middle portion of the radial canals. No sense-bulbs. This, like other species of *Obelia*, has the habit of swimming with the bell reversed, so that it appears somewhat like an umbrella turned wrong side out.

Colors.—The only color is in the light-yellowish ovaries and proboscis.

Distribution.—Abundant throughout Woods Hole region.

Obelia longissima (Pallas).

(*Sertularia longissima* Pallas, Elenchus Zoophytorum, p. 119.)

It is exceedingly difficult, if not impossible, to differentiate the medusæ of the various species of this genus. In some cases the only way to identify them is to see them given off from the hydroid colonies. I know of no means of distinguishing this species from the preceding except that the tentacles may be 20 instead of 24.

Distribution.—The hydroid colonies have been found at Woods Hole and off Gay Head.

Obelia flabellata (Hincks)[1]=*Encope polygena* A. Ag.?[2]

([1] Ann. and Mag. Nat. Hist., 3d series, vol. XVIII, p. 297. [2] North American Acalephæ, p. 86.)

Differs from the preceding in no constant feature that I am aware of.

Distribution.—Woods Hole; off Thimble Island (Verrill).

Obelia gelatinosa (Pallas)[1]=*Laomedia gigantea* A. Ag.[2] (Verrill).

([1] *Sertularia gelatinosa* Pallas, Elenchus Zoophytorum, p. 116. [2] North American Acalephæ, p. 94.)

Bell disk-shaped. Tentacles 16 at time of liberation, each with an inward-projecting spur. Otocysts 8, placed over bases of tentacles. Proboscis short, with mouth surrounded by four lobular lips or mouth-arms. Radial canals 4. Ovaries round, hanging beneath middle part of radial canals.

Colors.—Ovaries and proboscis light-yellowish.

Distribution.—Colonies have been found growing at New Haven, Conn.; along the Rhode Island coast, and in Vineyard Sound.



99. *Oceania singularis* Mayer.

Obelia dichotoma (Linn.).

(*Sertularia dichotoma* Linn., Syst. Nat., p. 1312.)

Bell very shallow, disk-shaped. Marginal tentacles 16 at time of liberation. Not distinguishable from the preceding.

Distribution.—Colonies dredged off Gay Head, 1 fathom (Verrill).

Oceania singularis Mayer.

(Bull. Mus. Comp. Zool., vol. XXXVIII, No. 1, p. 7.)

Bell rather shallow, flaring decidedly at margin, and with a well marked dome-shaped apical projection. Marginal tentacles 16, each bearing a sense-bulb at its base. There are rudimentary tentacles between bases of larger ones. Proboscis not extending beyond velum, and ending in four broad lobes or mouth-arms that are not fimbriated. Radial canals 4, bearing the ovaries on their upper portion. There is an otocyst between each pair of tentacles, including the rudimentary ones.

Colors.—"The entoderm of the proximal part of each tentacle bulb is turquoise-green, and the distal part is brownish-red. The entoderm of the proboscis and of the radial tubes in the neighborhood of the gonads is of a delicate turquoise tinge." (*Mayer.*)

Distribution.—Newport, R. I. Dr. Mayer kindly allowed me to sketch the type.

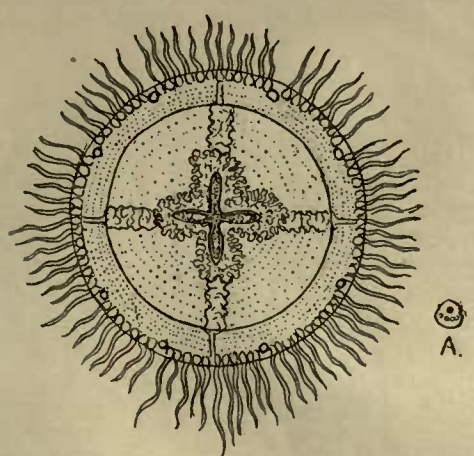
Tiaropsis diademata Ag. Fig. 100.

(Memoirs Amer. Acad., vol. IV, p. 289.)

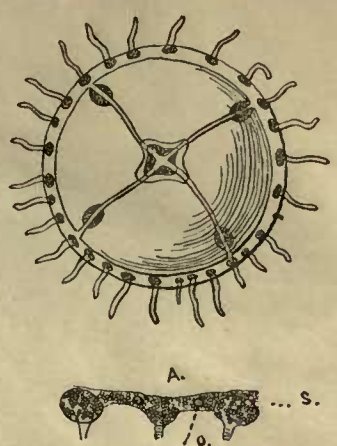
Bell hemispherical in adult, ovoid in young. Marginal tentacles numerous, with swollen sense-bulbs at the bases of the larger ones. Otocysts 8, situated between the bases of the tentacles and each containing a central dark dot with an arched row of refractile granules. Proboscis short, not reaching much more than halfway to the velum, and ending in four conspicuous, extensively frilled or fimbriated oral arms. Radial canals 4. Ovaries long, extending nearly to the circular canal.

Colors.—Specimens in formalin have the ovaries, oral arms, and tentacle bases light green.

Distribution.—Woods Hole, Mass. (Collected by Mr. Vinal Edwards.)



100. *Tiaropsis diademata* Ag. A. Otocyst (enlarged).



101. *Epenthesis folleata* McCr.
A. Details of margin. o. Otocyst. s. Sense bulb.

Epenthesis folleata McCr. Fig. 101.

(Proc. Elliott Soc., vol. I, No. 1, p. 191.)

Bell hemispherical, with thin walls. Marginal tentacles numerous, with sense-bulbs at bases. Otocysts alternating with tentacle bases. Proboscis short, ending in 4 lobular mouth-arms. Ovaries 4, round, hanging from under radial canals nearer to margin than to proboscis. Radial canals 4.

Colors.—Proboscis light green. Tentacular bulbs red.

Distribution.—Newport, Rhode Island.

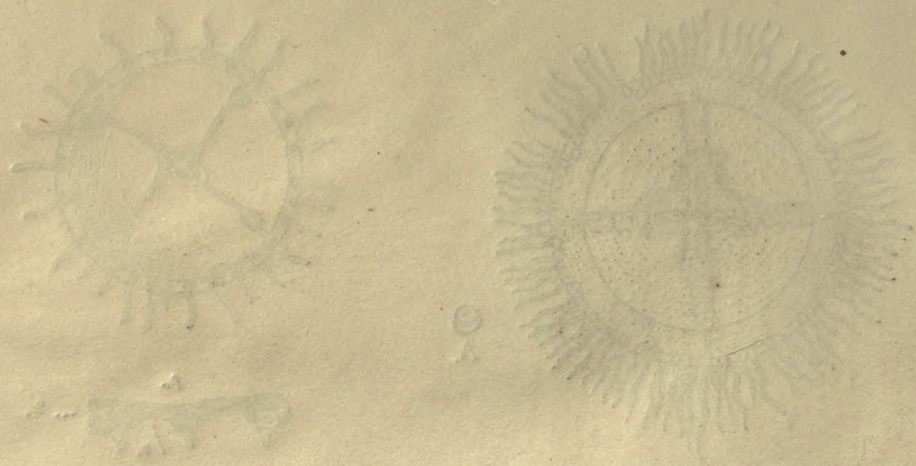
Trachynema digitale A. Ag. Fig. 102.

(North American Acalephæ, p. 57.)

Bell very deep, with an outline something like that of a bishop's miter, somewhat pointed above. Marginal tentacles numerous, but most of them are usually lacking in preserved specimens. Otocysts 4, according to Agassiz, but they seem to be lacking in the specimens (males) that I have examined. Proboscis long, reaching nearly to the velum, ending in a constricted portion bearing the mouth surrounded by four lobular or finger-like mouth-arms. Radial canals 8. Ovaries 8, long "sausage-like" organs, reaching sometimes halfway from the upper part of the bell cavity to the velum. Velum wide, strong, extensively wrinkled.

Colors.—Bell slightly pinkish. Contracted tentacles crimson at their extremity. Ovaries milky. Otocysts garnet-colored. (A. Agassiz.)

Distribution.—Newport, Rhode Island. Woods Hole. (Vinal Edwards.)



Gonionemus vertens A. Ag. Fig. 103.

(Cont. Nat. Hist. U. S., IV, p. 350.)

Bell hemispherical. Marginal tentacles numerous, each with a sense-bulb at its base, and a "knee-pad" of adhesive cells near its end which appear as thickenings of the tentacles at a short distance from their ends. Otocysts numerous between the bases of the tentacles. Proboscis short, not reaching more than halfway to the velum, and ending in four frilled mouth-arms. Radial canals, 4. Ovaries 4, forming convoluted bands following the radial canals to the bell margin.

Colors.—Tentacle bases emerald green and brown, with a black eye-spot. Proboscis and ovaries yellowish brown.

Distribution.—The Eel Pond, at Woods Hole.

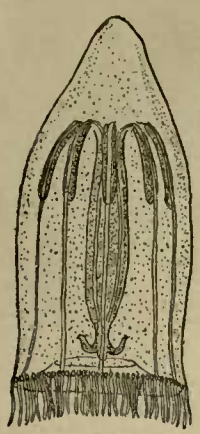
Melicertum campanula Esch. Fig. 104.

(Syst. der Acal., p. 105.)

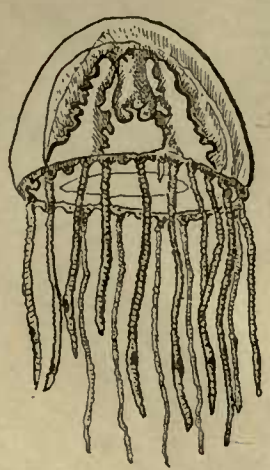
Bell deep, the upper portion somewhat narrowed. Marginal tentacles numerous, hollow, without eye-spots at their bases. No otocysts. Proboscis short, ending in eight frilled mouth-arms. Radial canals 8. Ovaries 8, convoluted, extending beneath the radial canals to the margin.

Colors.—Ovaries, proboscis, and tentacle bases light yellow.

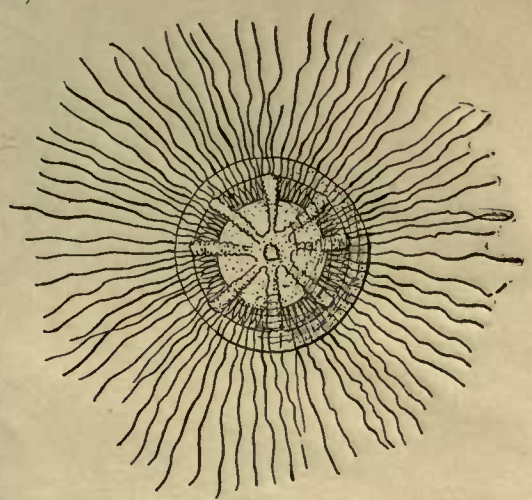
Distribution.—Woods Hole. (Vinal Edwards.)



102. *Trachynema digitale* (Fabr.).



103. *Gonionemus vertens* A. Ag.



104. *Melicertum campanula* Esch.

Æquorea albida A. Ag.

(North American Acalephæ, p. 110.)

Bell rather shallow, in the shape of a low dome with lateral outlines slightly sinuous. Marginal tentacles very numerous, with otocysts between their bases and without evident sense-bulbs. Proboscis small, but evident,[1] without mouth-arms. Radial canals very numerous.

Colors.—Radial canals appearing as whitish lines.

Distribution.—Buzzards Bay; Naushon. (A. Agassiz.)

I have not seen this species, and the above description is taken from that of the original describer.

Zygodactyla grœnlandica Ag.

(Cont. Nat. Hist. U. S., vol. IV, p. 360.)

Bell shallow, a low dome, hardly emarginate along the lateral outlines. Marginal tentacles exceedingly numerous, swollen at their bases. Otocysts numerous; situated between the tentacle bases. Proboscis large, thin-walled, reaching beyond the bell opening when not retracted, and sur-

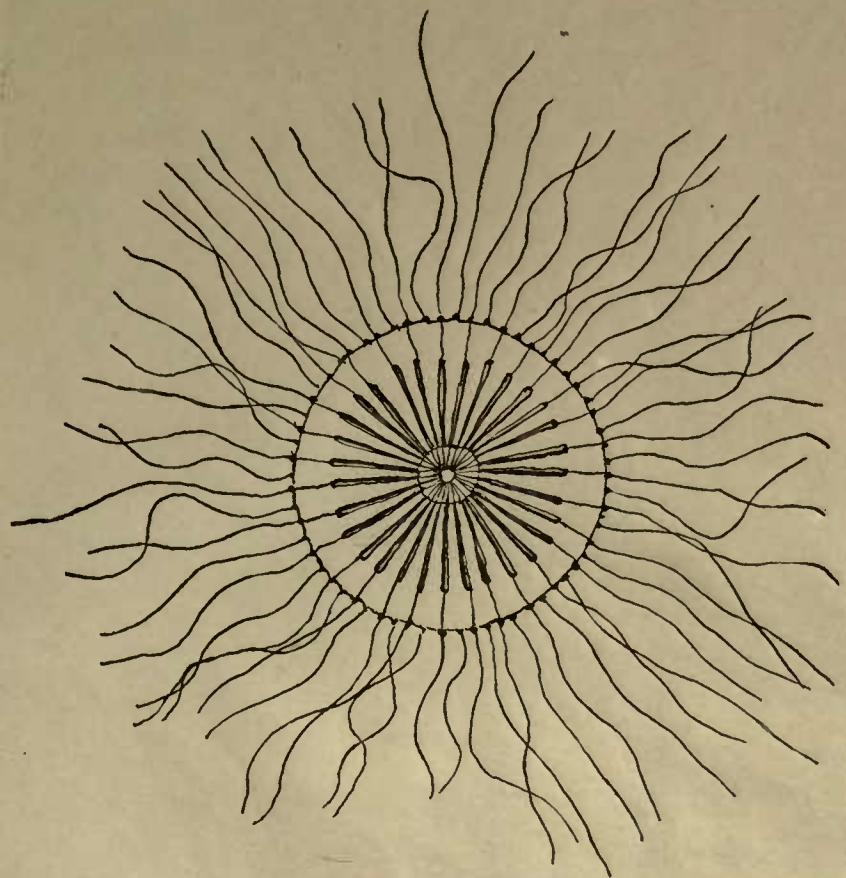
[1] Since the above was written numerous specimens of this species have been secured at Woods Hole by Mr. Hal. Childs.



rounded by extensively frilled or fimbriated mouth-arms. Radial canals and ovaries exceedingly numerous, the latter extending almost to the margin. Size very large.

Colors.—Not given by the original describer.

I have not seen this species, and condense the description from that of Dr. A. Agassiz.



105. *Rhegmatodes tenuis* A. Ag.

Rhegmatodes tenuis A. Ag. Fig. 105.

(North American Acalephæ, p. 95.)

Bell very shallow, disk-shaped, with a central elevated portion. Tentacles very numerous, slender. Otocysts numerous, situated between the tentacle bases. There is practically no proboscis, but an irregular aperture under the center of the bell surrounded by an irregularly striated membrane which forms the floor of the digestive cavity. Radial canals numerous, there being about 32 in specimen examined. Ovaries linear, numerous, reaching along the radial canals from the digestive cavity nearly to the margin of the bell.



105 A. Oral view of center of disk.

Colors.—There is very little coloration about this species. The ovaries are pale yellowish or brownish.

Distribution.—Naushon (A. Agassiz). Woods Hole.

